"EFFICACY OF PROLENE VS VICRYL IN SUBCUTICULAR CAESAREAN WOUND CLOSURE IN A TERTIARY CARE HOSPITAL"- A RANDOMISED CONTROL TRIAL

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CERTIFICATE

This is to certify that this dissertation titled **— "EFFICACY OF PROLENE vs VICRYL IN SUBCUTICULAR CAESAREAN WOUND CLOSURE IN A TERTIARY CARE HOSPITAL – A RANDOMISED CONTROL TRIAL"** is a bonafide work of **DR. G. APARNA**, and has been prepared under my guidance, in partial fulfillment of regulations of The Tamilnadu Dr. M.G.R. Medical University, for the award of M.S. Degree in Obstetrics and Gynecology during the year 2019 - 2022.

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I hereby declare that this dissertation / thesis entitled **— "EFFICACY OF PROLENE vs VICRYL IN SUBCUTICULAR CAESAREAN WOUND CLOSURE IN A TERTIARY CARE HOSPITAL – A RANDOMISED CONTROL TRIAL"** is a bonafide and genuine research work carried out by me under the guidance of **PROF DR. N. THAMIZHSELVI, MD., D.G.O.,** Department of Obstetrics and Gynecology, MADRAS MEDICAL COLLEGE, Chennai.

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Dr. G. APARNA

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INTRODUCTION

Caesarean sections have always been the most commonly performed abdominal operations worldwide [1]. Wound healing will be an essential factor for better patient satisfaction in patients undergoing caesarean section. Closure of the skin at the end of operative procedure is the most essential component of the procedure as per obstetrician view, since the skin scar is the inevitable price that a surgeon can justify for the tissue repair.

The rate of cesarean section is increasing almost among all the country across the world. In 1985 the World Health Organization (WHO) recommended that the cesarean section rate should be less than15% [2.] Since cesarean section is considered as safe procedure, adding to the concern for baby – mother health and safety, with increased attention to maternal choice, along with the importance given to aesthetic appearance of the skin in the present day[3]. So as to improve the technique and cosmesis, Pfannestiel in 1900 described a transverse suprapubic incision which was used by most of the obstetricians and gynecologists, for a safer and less painful closure with cosmesis postoperatively[4,5]. This incision can be reapproximated with subcuticular suture, just below the skin, which can be closed by either interrupted suture or continuous closure[6]. Identifying the best surgical material for a better healing and aesthetic result is a challenge and the various study has been proposed on to which method of closure has better healing property.

Finding a better suturing material, with reduced risk of infection, better healing with add on to cosmetic results, is a concern for all surgeons. Several types of complications occur after few days of surgery. Among the various complication wound complications are the most common morbidities for patients after surgery. The critical postoperative wound complications are surgical site infection (SSI's) that can result in an extended length of stay, additional costs, and a substantial amount of burden to health-care systems. Wound infection, and subsequent wound dehiscence, are most commonly reported complication among the patients and its incidence is mostly related to patients' medical conditions and the choice of suture materials used. Wound infection can be caused by a variety of organisms, although, typically by gram positive cocci-commensals of skin in normal patient, gram negatives and anaerobic bacteria are seen in patients undergoing gastrointestinal surgeries and immune – compromised patients.

Since 1970s, until recently, the aim is to quantify the cosmesis of the scar, with emphasis on various aspects namely colour, shape, and distinction from the surrounding neighboring tissues. There have been various criteria that are proposed to segregate the various cosmesis of the scar from aesthetically normal scars and the exuberant (hypertrophic) or even pathological (keloid) scars[7]. Trimbos et al.[8] proposed the aesthetic result of scar based on various components such as hypertrophy, colouration, width and transverse marks. There has been various study that clearly provides data on the best incision – Pfannenstiel, the best suture material for skin closure

being intradermal/ subcuticular continuous method. But there are divergences of opinion on which suture material would be the best material for such closure methods and there is various study available that has compared aesthetic results between various surgical suture material. The choice of suture material has been largely empirical in the past days. The art and the craft of surgery that we follow, have always been taught by a preceptor and the tendency has been to use the same suture material used by our preceptor[9]. Thus, in view of the increasing rate of cesarean section, which has been the most common method of delivery, according to WHO data, it is associated with a higher aesthetic value, it is pertinent to compare the aesthetic results, patient and observer satisfactions between two synthetic suture material, vicryl and prolene, since there are two types of suture material widely used at the time of surgery to close the skin. In surgical techniques the threads are divided into two categories: absorbable and non-absorbable.

Two types of suture material are widely used for cesarean section incision skin closure: vicryl polyglactin 910 , synthetic, braided, absorbable at about 91 to 119 days by the hydrolysis process, and prolene, synthetic, monofilament, non-absorbable, removed from about 7 to 10 days[10]. The present research is developed to analysis the following objective which is to compare the non-absorbable (PROLENE) versus absorbable (VICRYL) for subcuticular closure of the skin in cesarean section.

AIMS AND OBJECTIVE

To compare skin prolene vs vicryl in subcuticular caesarean wound closure for the following characters:

1. To compare wound complication- infection, gapping
2. To compare post operative pain
3. To compare wound cosmesis
4. To compare the patient and observer satisfaction

REVIEW OF LITERATURE

Frishman et al[12] showed that cosmetic outcome (using a 4-category scale, from excellent to poor) was superior in patients with subcuticular suture compared with staples, as rated by patients and nonblinded physicians. Moreover, the authors demonstrated that staples caused more pain than suture, both at discharge and at the 6-week postoperative visit. A study of mature post-laparotomy scars at least one year out revealed that the patients' overall impression of the wound favored a sutured closure with a smaller scar area (and free from staple marks) than staples. Hence, patients who care about skin marks would benefit more from subcuticular skin closure.

A 2012 Cochrane review reported that use of staples and subcuticular absorbable sutures were similar in terms of wound infection and wound complication rates, except that the incidence of wound dehiscence was increased with earlier (<4 days) removal of staples compared to suture closure in those women with Pfannenstiel incisions [13]. Thus, proving suture material superior to that of staples or other advanced techniques.

Mackeen et al. in 2015 [14], showed that the wound dehiscence and complication rates increased with use of staples, although the operating time was shortened by a mean of 5. 05minutes.The authors thus recommended that subcuticular closure of the skin with suture material should be preferred over

staples [15] though the operating time was less compared to that of staples, a healthier wound healing is much important than that of decreased time consumption for wound closure.

Tully et al. showed that 73.9% of the obstetricians preferred to close skin using subcuticular sutures using Prolene (41.1%), Vicryl (17.5%) followed by dexon (13.5%), and staples (10.4%) [16]. The subcuticular absorbable sutures with surgical staples for caesarean wound closure were compared in this literature. Closure with subcuticular suture materials were reported to have more advantageous in terms of wound healing, better cosmetic results and increased patient satisfaction rates [17,18.] Thus, suture closure in subcuticular technique has thus again proved to be superior in terms of patient and observer satisfaction.

Tan et al. conducted a study comparing the various suture materials and reported that absorbable sutures had better cosmesis and wound healing and that nonabsorbable sutures have a disadvantage of requirement of removal [19,20]. This was one of a study that preferred wound closure with a absorbable suture material for the reason of reducing the need for follow up visit to remove the suture material in case of wound closed with non-absorbable suture material.

Antonella Cromi et al. compared stapled wounds with subcuticular sutures result of which showed equivalent cosmetic appearance of the scar [21]. This study elucidated that wound closure with any time of suture material, be it absorbable or non- absorbable material the final results of wound healing and cosmesis had a similar outcome in both groups.

PJnar Solmaz Hasdemiret al, study showed that there was no significant difference in terms of wound complications between the type of suture material used. Also, that the wound healing was better with nonabsorbable suture materials, although this difference did not affect the patient's satisfaction rate [22]. This study stated that the wound healing was better with non- absorbable material used. The other variable of a healthier wound healing showed that non-absorbable material was no superior to absorbable or other types of wound closure.

ANATOMY OF THE SKIN

The skin or the integument is the largest external organ which protects us against mechanical trauma, UV light and infection. In addition, to the above function the skin is concerned also with thermoregulation, sensory perception, conservation and excretion of fluids, and of course has aesthetic role for appearance of the individual. The histology of the skin comprises 2 layers, the epidermis and the dermis.

EPIDERMIS

The epidermis is composed of 5 layers

1. **BASAL CELL LAYER (STRATUM GERMINATUM):**

The basal cell layer is made of a single layer of keratinocytes which is the junction between the epidermis and dermis layer. The nuclei of these cells are arranged perpendicular to the basement membrane of epidermis. These cells are hyperchromatic and usually contain a few mitoses indicating that these superficial epidermal layers originate from the basal cell layer. These cells are interconnected by means of desmosomes with each other and with overlying squamous cells. Melanocytes are a type of dendritic cells which will be present as every tenth cell in the basal layer interspersed between keratinocytes. These cells are composed of small nuclei with clear cytoplasm containing melanin pigment granules which will determine the appearance of an individual. The various other type of dendritic cells present in the basal layer are Langerhans cells which are derived from bone marrow, mononuclear-phagocyte system.

2. **PRICKLE CELL LAYER (STRATUM SPINOSUM):**

This layer is composed of several layers of squamous cells orpolygonalcells. These layers become flat as they approach near the surface such that their long axis appears parallel to the skin surface. These cells also possess intercellular bridges or tonofilaments, which are intercellular cytoplasmic PAS positive material considered as precursor of keratin.

3. **GRANULAR CELL LAYER (STRATUM GRANULOSUM):**

This layer is composed of 1 to 3 layers of flat cells that contain keratohyaline basophilic granules, which are PAS negative. This Granular cell layer will be thicker in palms and soles.

4. **STRATUM LUCIDUM:**

This layer is a non-nucleate zone. The layer is present exclusively in palms and soles as a thin homogenous eosinophilic layer.

5. **HORNY LAYER (STRATUM CORNEUM)**:

This layer is also normally devoid of nuclei and is made of eosinophilic layers of keratin. This layer also consists of intraepidermal nerve endings in the form of Merkel cells which are touch receptors of skin.

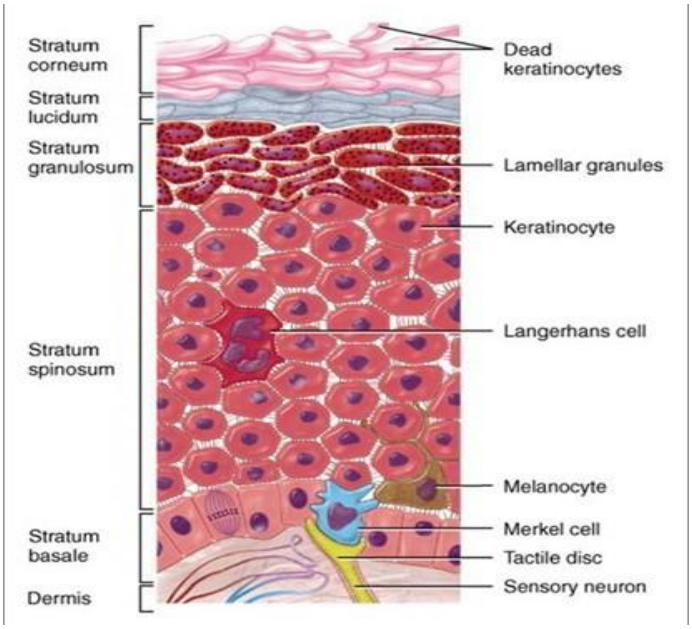


FIG 1: LAYERS OF EPIDERMIS

DERMIS

It is composed of 2 parts namely, a superficial papillary dermis and a deeper reticular dermis. It is also composed of fibrocollagen tissue along with blood vessels, lymphatics and nerves. The pacinian corpuscles are the specialized nerve endings which are present in the deep layers of skin, which are concerned with pressure receptors of skin. The other specialized nerve endings present in this layer are

1. Meissners corpuscles (touch receptors),
2. Ruffini"s corpuscles (cold receptors),
3. End bulbs of Krause.

This layer also contains adnexal structures such as:

1) **SWEAT GLANDS:** These are of 2 different types

***ECCRINE GLANDS:**

These glands are present all over the skin but are in maximum distribution over the palms, soles and axilla. These are coiled tubular glands which are present deep in the dermis. The ducts of these glands pass through the epidermis onto the surface of the skin as pores via which they empty their secretions. The glands are usually lined by two main types of secretory cells namely, basal acidophilic chief cells and the superficial basophilic dark granular cells. The secretory cells of this glands are surrounded by myoepithelial cells.

***APOCRINE GLANDS:**

This type of glands is encountered in very few areas only of which namely, the axilla, the anorectal region, in the external ear these modified glands are called ceruminous glands, in the eye lids the glands are present as Moll"s glands and in the breast as mammary glands. Apocrine glands are also tubular glands in structure but these secretory cells contain acidophilic PAS positive with prominent granular cytoplasm. These glands secretion is decapitation secretion method.

***SEBACEOUS (HOLOCRINE) GLANDS:**

These glands are found almost everywhere on the skin except on the palms and soles. They are found often in association with hair such as in the nipple and areola of male and female breast, external auditory meatus, labia minora, prepuce and in the meibomian glands of the eyelids. Sebaceous gland is composed of lobules of sebaceous cells which contain small round nuclei and with abundant fatty network like cytoplasm.

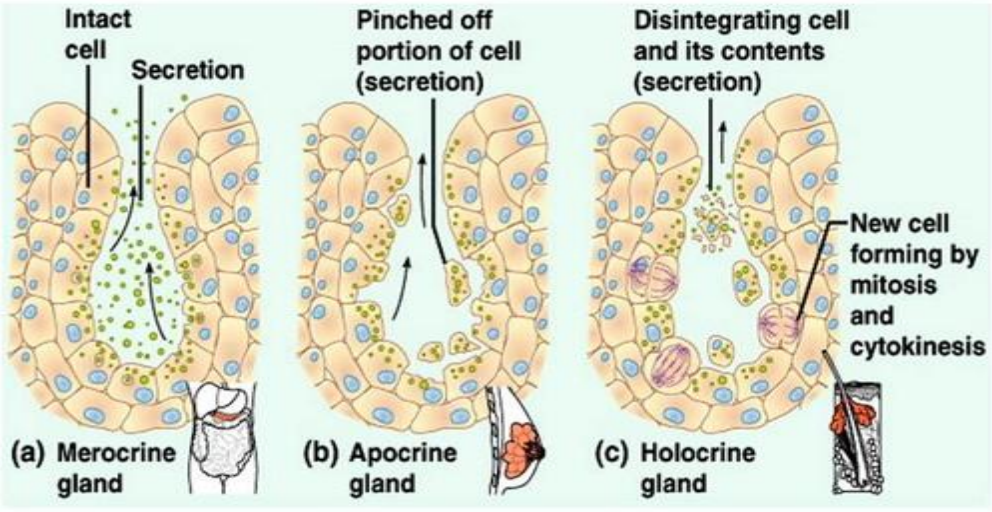


FIG 2: TYPES OF SWEAT GLANDS

2)HAIR:

The hair grows from the bottom of the hair follicle. Thus, hair has an intracutaneous portion present in the hair follicle and the shaft. The hair follicle is composed of epithelial and connective tissue components. The hair shaft is made up of 3 parts - an outer sheath, a pigmented cortex and an inner medulla.

3)ARRECTORES PILORI:

These are smooth muscles arranged as small bundles attached to each hair follicle. When these muscle contracts the hair becomes more erect and the follicle will be dragged upwards so as to become prominent over the surface of the skin to produce what is known as the “goose skin”.

4)NAILS:

They are thickenings of deeper part of the stratum corneum that develop at specially modified portion of the skin which are called as the nail bed. The nail is composed of clear horny cells, resembling stratum lucidum but are more keratinized than the stratum lucidum.

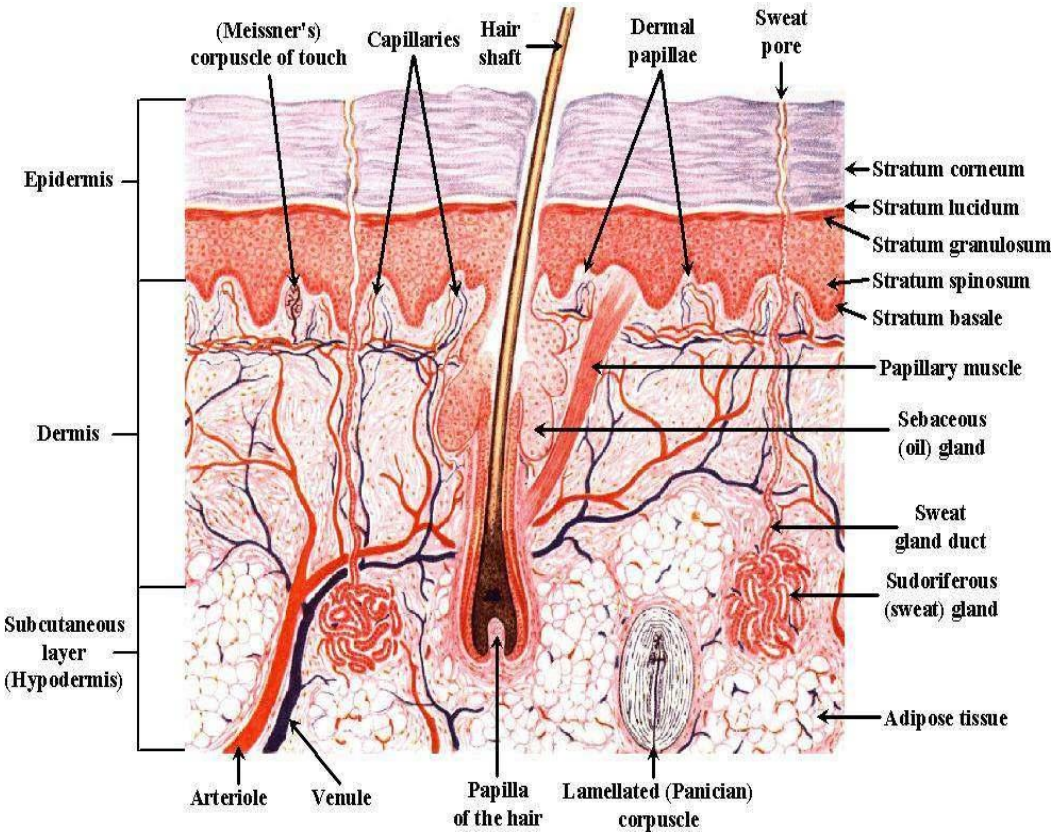


FIG 3: LAYERS OF SKIN

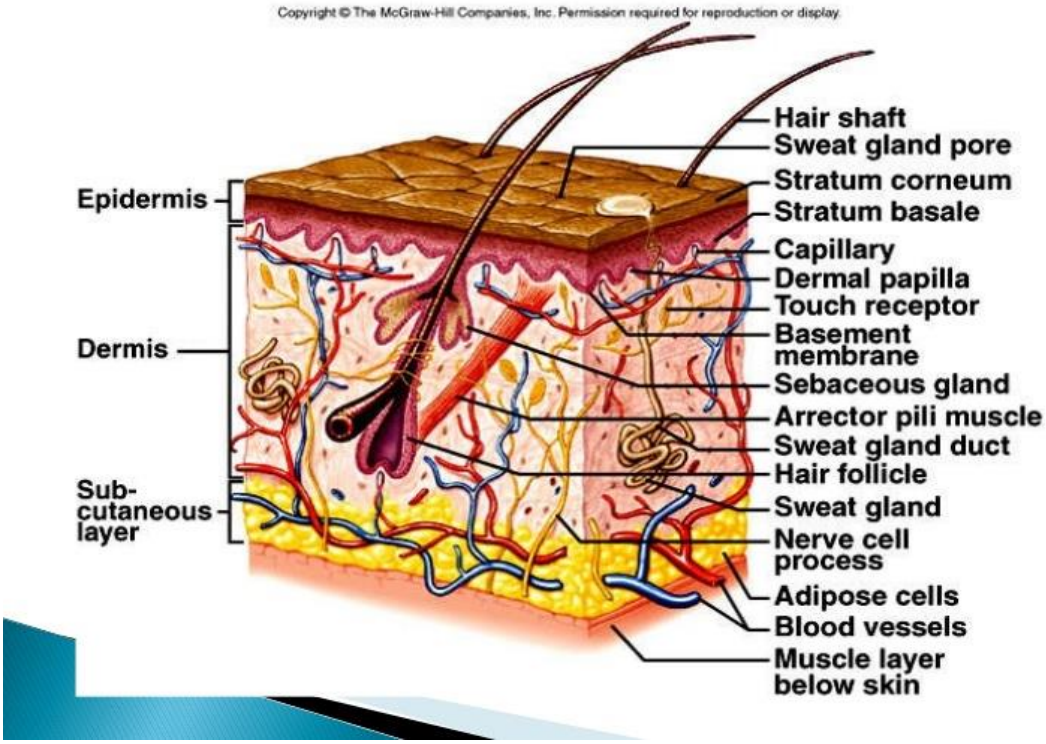


FIG 4: STRUCTURE OF SKIN

HISTORY [23,24,25]

The act of sewing was started as old as homosapiens. In Susrutha Samhita 600 B.C there was mention of use of suture material which was made from animal sinews, leather strips, vegetable fibers and braided home hair. The very earliest closure of wound was found by Edwin Smith Papyreus written in Egypt around 3000 – 2500B.C. As early as 5000 – 3000 B.C eyed needles was used initially to suture the surgical wounds.

In 1600 B.C Egyptians used the linen strips which will be coated with honey and flour for skin closure. In 150 A.D, Galen of pergamon was the first physician ever to use plain catgut which was manufactured from intestines of sheep and its applications are even used now.

Back then South Americans made use of Large black ants for wound closure. These ants would be left to bite the wound edges together using their powerful jaws similar to the staples / Michael Clips. The ant's body was then finally twisted off leaving the head in place to hold the tissue edges together.

Surgical wound closed with linen thread in the presence of gross infection was broken down rapidly. In order to overcome this situation, Avicenna, who was the prince of physicians, invented the first monofilament suture by using pig's bristles.

Albucasis, the prince of surgeons, was the first person to describe a double suturing technique which is still used today. Ambrose Pare, the father of surgery, made use of dry suturing method for facial wounds where the ends of wound were stuck on each side with plaster strips and then suturing the strips together.

John Hunter preferred closure of wound using interrupted sutures and application of bandage or sticking plaster across the wound to keep them compressed and approximated. Physics also experimented use of adhesive strips which was made of leather. These adhesive plaster strips were dissolved after contact with wound discharge. His experiments were historic in considering the idea of the possibility of an absorbable suture material.

In 1869, Joseph Lister noticed that when the fragments of glass or needles are inadvertently left in the wound did not predispose to complication such as abscess or infection. Thus, he concluded that harmful bacteria should lie within the interstices of silk to produce complication but if they are killed, a ligature could be left in situ without any complication. This ideology led to the development of concept of Antiseptic ligatures. Lister incorporated chromic acid, which is used to tan leather, in to his formulation to reduce wound complication. In 1902, claudices introduced iodine sterilization technique of sutures material.

In the first world war, Britain was having very few or almost no catgut industry. Local pharmacist George Merson undertook the process of commercial manufactures of this suture material in field. These were named as Mersutures. One of the most important technical advances in the field of suture manufactures was introducing sterilization process by irradiation using isotope of Cobalt 60 in 1960. This was a revolutionary development in surgical field of suture packaging as it helped in overcoming the difficulties in aseptic transfers.

Because of this excellent handling properties, silk was the suture material of choice in non-absorbable suture range, since the linen and cotton were in use already. Polyester and polyamide were then introduced and almost replaced these non-absorbable sutures material. Polyester was manufactured in various ways as braided, coated and non-coated. Now polyester is available in use as monofilament. Then monofilament namely polypropylene was made, which fulfilled most of the characteristics of ideal suture material. It replaced almost all the non-absorbable material namely silk, cotton and linen.

Then was the era of synthetic absorbable sutures. In 1931, the development of absorbable synthetic suture material began with the production of absorbable synthetic fiber made of polyvinyl alcohol. In 1960"s an absorbable suture material which favoured most of the suturing properties,

polyglycolic acid was processed. This was then combined with glycolide and lactide to develop polyglactin 910, vicryl and monocryl which were all developed from then on.

WOUNDS AND WOUND HEALING

WOUNDS

DEFINITION:

A wound is defined as a break in continuity of skin or in tissues, which can be associated with disruption in function and the structure of skin or an intact tissue.

CLASSIFICATION OF SURGICAL WOUND:

1. CLEAN WOUND

   A non-penetrating wound without a contamination.

   Elective, non-traumatic, primarily closed, no acute inflammation; without break in continuity; without penetrating into respiratory, gastro-intestinal, biliary or genito-urinary tracts.

   - Caesarean section.
   - Excisional procedures.
   - Surgeries of the brain, joints, heart transplant.
   - Infective rate is less than 2%.

2. CLEAN CONTAMINATED

A controlled entry into the hollow muscular viscus, with minor break in aseptic technique.

Elective opening of respiratory, gastrointestinal, biliary or genito urinary tract with minimal spillage (e.g., appendicectomy) not encountering infected urine or bile; minor technique break.

- Appendicectomy.
- Bowel surgeries.
- Surgeries in gallbladder, biliary and pancreas.
- Infective rate is 10%.

3. CONTAMINATED WOUND

An open, fresh, traumatic wound.

Incision on a site with acute non purulent inflammation, with a major break in the aseptic technique.

Gross spillage from gastro intestinal tract; entry into biliary or genitourinary tract in the presence of infected bile or urine; major break in technique, penetrating trauma

<4hours old; chronic open wounds to be grafted or covered.

- Acute abdomen surgeries.
- Open fresh RTA wounds.
- Infective rate is 15-30%.

4. DIRTY INFECTED WOUND

A contaminated wound with purulent inflammatory condition and a penetrating injury.

Pre-operative perforation of respiratory tract, gastro intestinal system, biliary or genitourinary tract, penetrating trauma >4hrs old.

- Abscess drainage.
- Pyocele.
- Empyema gallbladder.
- Faecal peritonitis.
- Infective rate is 40-70%

Wound Healing

"A scab is a beautiful thing – a coin the body has minted with an invisible motto: In God We Trust. Our body loves us and, even while the spirit drifts dreaming, works at mending the damage that we do".

JHON UPDIKE, 1984

TYPES OF WOUND HEALING

- Primary Healing (First intention):

It occurs mostly in a clean incised surgical wound. The wound edges are approximated with suture technique. Ultimately there is more epithelial regeneration than fibrosis. Thus, wound heals more rapidly with complete

closure at the end. The Scar of this type of healing will be a linear, more smooth and supple.

- Secondary Healing (second intention):

  This type of healing occurs in a wound in which there is an extensive soft tissue loss, like following a major trauma or burns and in wound with septic foci. In this type, the healing will be slowly associated with more of fibrosis. This can result in a wide scar, often hypertrophied and contracted, which may ultimately lead to disability.

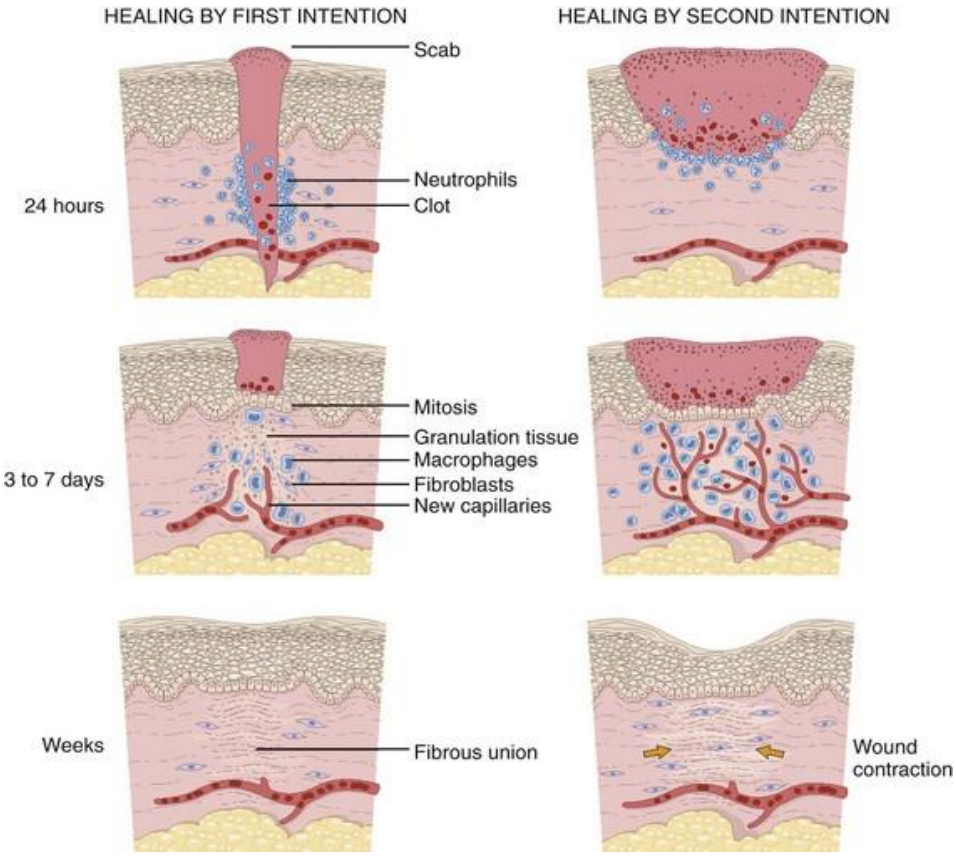


FIG 5: TYPES OF WOUND HEALING

STAGES OF WOUND HEALING

- Stage of inflammation.
- Stage of granulation tissue formation and organization.
- Stage of epithelialisation.
- Stage of scar formation and resorption.
- Stage of maturation.

PHASES OF WOUND HEALING

HEMOSTASIS

It involves platelet aggregation, followed by degranulation and fibrin formation

INFLAMMATORY PHASE: (Lag/substrate/exudative phase)

This phase begins immediately following wound healing. This phase usually lasts for 4-6 days. The following Features of inflammation are observed rubor, calor, tumour, dolor and loss of function. In this phase macrophages secrete fibroblastic growth factor which enhances angiogenesis. Usually polymorphonuclear leukocytes (PMN leukocytes) appear after 48 hours which secrete inflammatory mediators and bactericidal oxygen derived free radicals. These cells involved in removal of clots, foreign bodies and bacteria present in the wound. The various chemical factors involved in wound healing process are growth factors- platelet derived, epidermal growth factor, transforming growth factor; interleukin; tumour necrosis factor; prostaglandins; collagenase and elastase.

PROLIFERATIVE PHASE: (Collagen/Fibroblastic phase)

In this phase fibroblast are primarily involved in production of Collagen and glycosamines. This phase begins from 7 days of injury and lasts for 6 weeks. Enzymes such as iron, alpha ketoglutrate and vitamin C are involved in the production of Hydroxylproline and hydroxylysine. Tropocollagen produced in the wound will aggregate together to form collagen fibrils which gives 80- 90% of their final strength (in postoperative wounds) is achieved in 30 days.

REMODELING PHASE: (Maturation phase)

This phase begins from 6 weeks of injury and lasts for 2 years. In this phase there is maturation of collagen by cross–linking among them collage fibrils which is responsible for the scar and its strength. Collagen production is stopped after 42 days of wound healing.

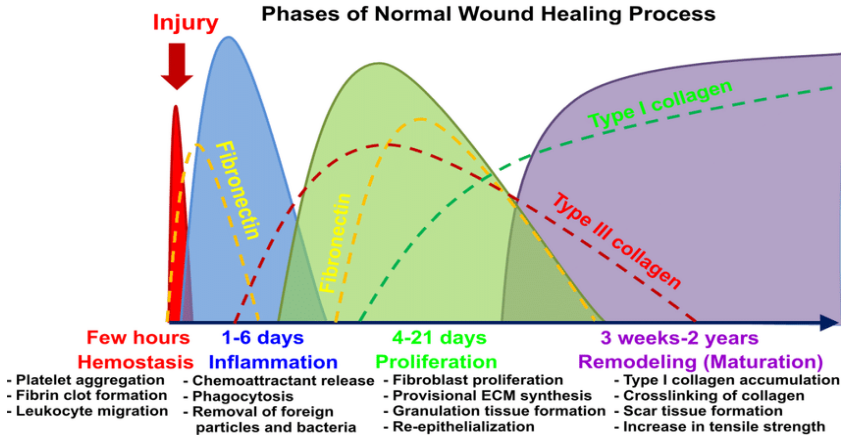


FIG 6: PHASES OF WOUND HEALING

FACTORS AFFECTING WOUND HEALING

There have been various factors proposed to impair the normal wound healing process. They possible factors are as follows,

LOCAL FACTORS:

The local factors present within the wound which in itself that impairs the healing process are,

- Infection.
- Presence of necrotic tissue and foreign body in the local area.
- Poor vascularity.
- Venous or lymphatic stasis.
- Tissue tension.
- Haematoma.
- Poor apposition or large defect in the wound failing primary closure.
- Recurrent trauma to the same wound area.
- X-ray irradiation to the area.
- Site/ location of wound, e.g., wound present over the joints and back has poor healing.
- Associated diseases like osteomyelitis and malignancy.
- Mechanism involved and type of wound such as incised/lacerated/crushed/avulsion.

GENERAL FACTORS:

- Age, and BMI.
- Malnutrition.
- Anaemia.
- Smoking.
- Malignancy.
- Uraemia.
- Jaundice.
- Diabetes and other metabolic diseases.
- HIV and other immunosuppressive diseases.
- Steroids and use of cytotoxic drugs.
- Neuropathies of various causes.

Complications of wound healing

As wound healing is a very microprocess, there can be various factors that can impair healing and thereby complicating the wound in itself. Of them the various complications are,

1) Painful scars
2) Implantation cyst
3) Keloid formation
4) Neoplasia
5) Cicatrisation of the wound
6) Wound gaping in need of suturing technique

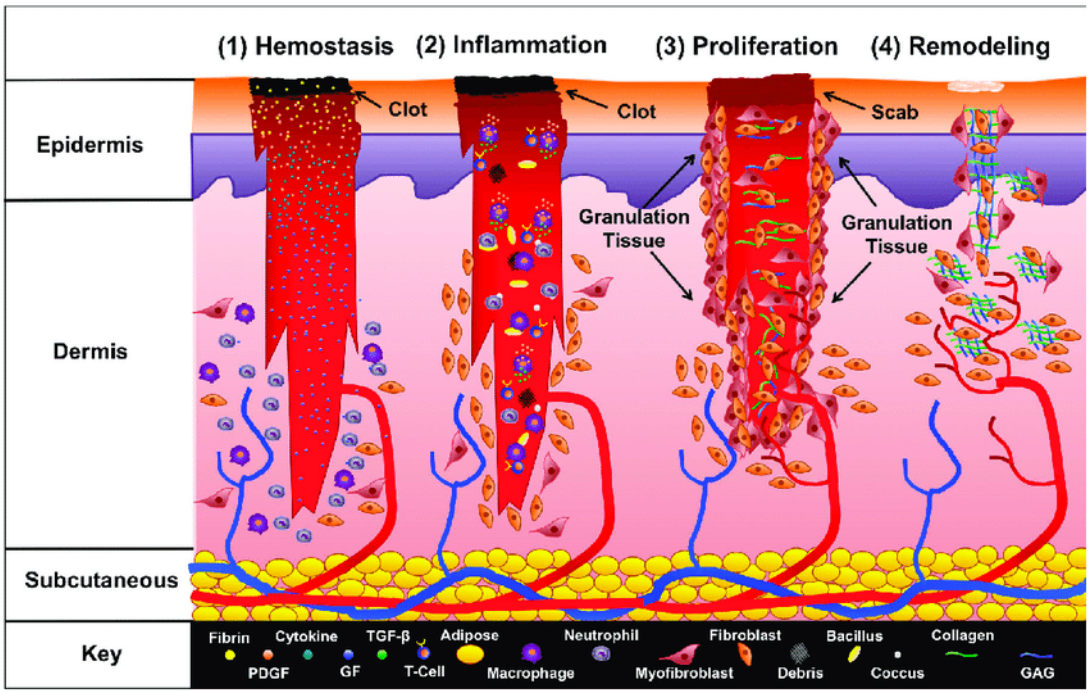


FIG 7: PATHOGENESIS OF WOUND HEALING

SUTURE MATERIAL

SELECTION SUTURE MATERIAL:

When choosing a suture material, it is important to consider the various factors such as

1. Location of wound,
2. Dynamics of wound tension,
3. Presence of wound infection or fever and
4. Cost of suture material used.

If there is chance of fever or infection, then deep sutures made of synthetic monofilament sutures are desired, since braided sutures are commonly associated with increased rates of infection and are rapidly degraded by infection or fever.

I. For continuous subcuticular sutures, polypropylene, poliglecaprone 25 or glycomer 631 are materials usually considered, since they have a very minimal tissue reactivity.

II. For approximation of skin, the smallest suture for the pertained area should be used.

III. For low tension and thin-skinned areas namely eyelids and scrotum 6-0 can be used and 5-0 is generally used for the face.

IV. For wound in the facial areas closed under tension, such as forehead and elbow areas 4-0 can be used.

V. In thick skinned areas, such as scalp, back and scapular areas, closed under tension choice should be 3-0 or 2-0 to maintain the wound integrity.[16]

VI. Silk has always been the best material of choice for approximation of mucosal and intertriginous areas but at the compromise of cosmesis.

SUTURE

Suturing is a method of sewing by means of needle and a thread, which is made of a suture material. Suturing is done to keep the wounds approximated until they heal sufficiently well by natural fibres (collagen) and from a strong scar. Suture materials are mainly categorized into 2 groups – absorbable and non-absorbable. These materials can be made of natural or synthetic material.

Depending on the number of strands used to make a suture material, sutures may be classified as follows:

1. Monofilament sutures:

They are made of a single strand of fibre. These suture materials are smooth and strong in tensile strength. They have very less chance of bacterial contamination. The disadvantage is that knot placement is difficult as it may become loose.

Examples – Polypropylene, polyglactin, polyamides, polydiaxanone, catgut, monocryl.

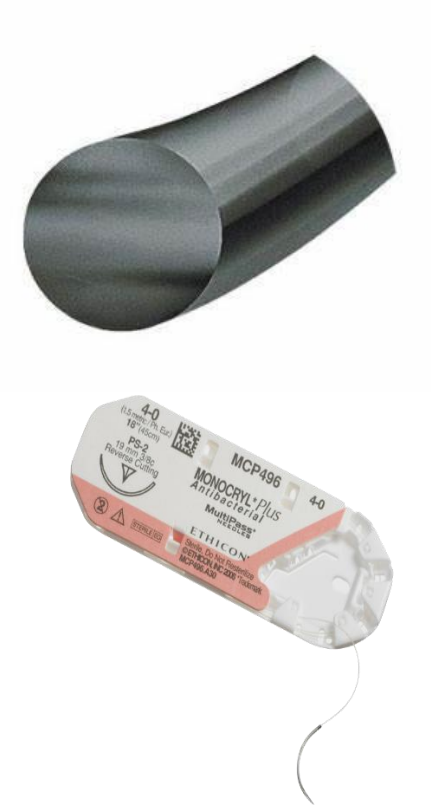


FIG 8: MONOFILAMENT

2. Polyfilament sutures:

This type of suture material is made of multiple strands braided together. Their handling technique is easy and advantage being that the

knot tied do not slip away. The major disadvantage in its use is that the bacteria may lodge in the cervices of the sutures and thereby facilitate infections. Example - silk, linen, braided polyester, braided polyamide, polyglactin, polyglycolic acid.

PGA multifilament
with resolactone coating

FIG 9: MULTIFILAMENT

Criteria of an ideal suture material:

a. Cheap and easily available
b. Easy handling property
c. Good knotting property
d. Non-allergic& non-carcinogenic

e. Minimal tissue reaction

f. Recoil property to prevent wound contraction

g. Adequate tensile strength

h. Pliable to adjust wound edema.

Properties of suture material:

The suture material to be ideal should fulfill the following properties,

1) Knot strength:

It is the amount of force that is necessary to cause a slip of knot. It's related to the coefficient of static friction and plasticity as well the diameter of the material.

2) Tensile strength:

It is defined as the measure of the suture material ability to resist a breakage or deformation.

3) *Pliability:*

This is helpful for the surgeon providing an ease to handle. It's the ability to hold the knot secured in place.

4) Breaking strength:

It's the limit of the suture material ability to bear the tensile strength following which there is a giveaway.

5) *Elasticity:*

It is defined as the ability of the material to bear as the intrinsic tension developed after some lengthening that makes it to regain its original strength.

6) Memory:

It is the capability of the suture material used to return to its original from or length after undergoing a tension force. It is simply defined as the stiffness of the material used to resist deformation.

ABSORBABLE SUTURE

The absorbable suture material can be made of natural or synthetic material,

NATURAL

Catgut:

The surgical catgut is one of the earliest discovered materials which is made from the submucosa of the small intestine of sheep also from cow. The intestine is then processed by various techniques such as stripping and cleansing and the final ribbon processed is a pure submucosal collagen. The ribbons will then be chromed, twisted together and finally slowly dried under tension. Chromic catgut is manufactured by treating catgut with chromic acid salt to help in better cross linking that delays hydrolysis and minimizes the tissue reaction. They will be polished and sorted according to size. These materials are sterilized by means of gamma irradiation or ethylene oxide which will be then packed with 70% alcohol and glycerol with water to resist breakage.

Absorption: Plain catgut is absorbed in a week, whereas chromic catgut lasts for 10 to 40 days. Absorption is unpredictable particularly in situations

where the wound is contaminated or infected, which makes the surgeons prefer synthetic absorbable material is more nowadays.

Sterilization technique: Under pure Lysol for 30 minutes, 20 lysol solution /1 in 20 carbolic lotion for 24 hours for sterilisation.

The catgut has been graded according to thickness and strength from 0000(4/0) to 4. The fine catgut material is used for tying subcutaneous bleeder and fat and No. 0/ No. 1 is used for peritoneum. No. 1 is also used in suturing of muscles, fasciae and blood vessels. Chroming not only delays absorption but significantly reduces the tissue irritation.

Advantage:

1. Used also in the presence of infection.
2. Presence of infection does not cause a reduction in its tensile strength.

Disadvantages:

1. Not very cheap
2. Irritant because of alcohol
3. Tensile strength is less compared to other material.
4. Knot holding is not ideal
5. The source of production is undeniably septic. If sterilization technique is compromised, it itself can initiate virulent infection such as tetanus.
6. It can trigger immune response

SYNTHETIC

Polyglycolic acid:

The material is made of polymerized hydroxy – acetic acid (Polyglycolic acid). The suture material is liquefied, extruded as filaments, stretched and braided together to form a suture material. Size 0 contains 192 filaments, while 3/0 contains 80 filaments.

Absorption: Comparing with the catgut, the rate of absorption is much slower.

Sterilization technique: ethylene oxide.

Advantages:

1. Better pliability
2. Knot is secured well
3. Minimal tissue reactivity
4. Good tensile strength
5. Absorption occurs by 60 – 90 days, much later than catgut by a process of slow hydrolysis.

Disadvantage

1. Tensile strength is good but there is reduction in it by 15 days.

Polyglactin (vicryl):

The material is braided suture which retains its strength and integrity for a longer duration. The material is available in various size from 9/0 to 1.

These sutures material is available both as monofilament and polyfilament type

Tensile strength: About 30 days and gets completely absorbed

Absorption: Hydrolysis technique in about 80 to 90 days and there is tissue reaction with its use.

Uses: Ideal for bowel anastomosis, bladder repair and mainly in the vascular surgery.

Advantage: Handling property is good and the knots are secured as it is braided.

Vicrylrapide:

It is undyed form of vicryl, which is manufactured by exposing quoted vicryl suture to Gamma radiation.

Tensile strength: 10 to 12 days.

Absorption: Rapid absorption within a duration of 40 days, hence named so.

Uses: Subcuticular closure of skin and in place of skin suture where the suture need not be removed. It is specially used for circumscision.

Monocryl suture:

This is a monofilament suture. This material is composed of 75% glycolide and 25% caprolactone – forming polyglecaprone. It is also available in both undyed form or dyed form in violet color. The material possesses a good handling property. The material has double the strength of chromic catgut.

Tensile strength: 21 days

Absorption: Hydrolysis in about 100 to 120 days.

Sterilization technique: Ethylene oxide.

Uses: A substitute for catgut. It may be used in peritoneum closure pyeloplasty or ureter repair, intestinal anastomosis and peritoneum.

Polydioxanone (PDS):

It is also a monofilament suture. It is dyed violet.

Tensile strength: About 60 days which is probably the highest.

Absorption: Hydrolysis in about 180 to 200 days.

Uses:

Abdominal operations especially anastomotic procedures such as gastro-esophageal anastomosis or intestinal anastomosis or biliary enteric anastomosis.

Advantages:

1. Its soft and smooth with a very easy in handling and knotting characteristic.
2. Its best suture material among the synthetic absorbable suture

NON-ABSORBABLE SUTURE

The non-absorbable suture material is also made of natural or synthetic material,

NATURAL

Silk:

It is a natural suture composed as a silicone coated nonabsorbable braid. The material is a protein thread spun by silkworm larva in making its cocoon. The material is composed of a central core of fibrin which is peripherally covered with a thin layer of serecin (the silk albumin) which is removed. Silk is braided to give it an added strength with an advantage of better holding qualities.

Types:

1. *Floss silk*: It's a loosely twisted silk fibre which allows the infiltration of fibroblasts and its further incorporation with collagen thereby to provide a strong repair in hernias. Repeated boiling or autoclaving will not reduce the tensile strength but the knot does become more friable.
2. *Black braided silk*: They are available as materials mounted on atraumatic needles named as Mer silk. They are of different sizes from 7/0 to 1.

   Sterilization technique: Gamma irradiation.

   Uses:

1. In surgeries that needs a non-absorbable material namely in abdominal operation particularly for ligating the pedicles in nephrectomy surgeries or in splenectomy surgeries, this suture is used.

2. It’s used to ligate the anterior and posterior division vagus nerves before their division in cases of Truncal vagotomy, to ligate cystic artery and cystic duct in cholecystectomy.

Advantages:

1. It’s stronger than catgut.
2. Best handling materials.
3. Better knots property.
4. Knot slippage is very less.

Disadvantages:

1. Silk has capillary action that allows conduction/ passage of tissue fluid along the strand which serves as an incite for contamination. This can be reduced by making the material non-capillary by either wax or silicone coating.
2. It has a higher irritant property that incites a polymorphonuclear reactions. Thus, its unsuitable in infectious/unsterile wound which makes it mandatory to remove the stitch for the wound to heal.
3. Tensile strength is lost after 6 months in the tissues.
4. Owing to the capillary property, it loses its popularity as a skin suture. Suture abscess more often occur following silk suture.

Silkworm gut – It’s a monofilament**.** This is also named as “unspun silk”. In this the silkworm is usually killed before it is ready to spin its cocoon and the

raw silk precursor will be removed from the silk sac and is then hardened enough to form strands of 12 inches length material.

Advantages:

1. Smoother.
2. More strong and inert.
3. Autoclaved without causing damage to the material.

Disadvantage:

1. Decreased pliability.
2. Doesn't owe any advantage over the synthetic monofilament.

Cotton:

It is a vegetable material manufactured from the seeds of the plants which is composed of the unicellular hairs.

Advantage: Less irritant.

Disadvantage: Weakest suture material. It gains strength when wet and when combined with polyester it becomes a stronger material.

Linen:

It is a cellulose material, manufactured from the flax fibres composed of twisted long staple.

Advantage: Good handling property and cheap.

Disadvantage: No advantage over silk and used only in gastro-intestinal surgeries

SYNTHETIC

Polyamides (Nylon):

It's a monofilament suture. Monofilament nylon is the ideal material of choice for closure of the abdominal muscular aponeurosis, closure of skin incision and in abdominal wall incision.

Nylon, a synthetic polyamide is used in skin suture. Braided nylon has better handling property and suitable for hernia repair.

Advantages:

1. Inert property renders it to be used in infectious wound.
2. Better tensile property than silk.
3. Its strength allows it to be autoclaved thrice before losing the property.

Disadvantage:

1. Poor knotting property.
2. Multiple knots are needed for security.
3. Poor handling property.

Polyester:

It is a multifilament suture filament. It's available in the trade name of DACRON and TERYLENE.

Advantages:

1. Good handling property.
2. Possesses high tensile strength in tissue indefinitely.
3. Property of serum proof.
4. It has strength that allows it to be autoclaved several times without any damage.

Disadvantage:

1. Poor knotting property.

Polyethylene – This material is a high molecular weight polymer with a very strong inert property. It is made with a high tensile strength and has good pliability property.

Sterilization: Ethylene oxide.

Advantage: Its inert property has been made used in making mesh which is now commonly used in hernia surgery.

Disadvantage: It gradually loses its strength and then ultimately breaks hence; it is unsuitable for cardiovascular surgery.

Polypropylene – The suture is a polymerised propylene, which is manufactured as monofilament and coloured bright blue.

This suture is available in sizes from 8/0 to 1. 2/0 and 3/0 sutures are used in repair of tendon injuries. Finer sutures such as 4/0 or 5/0 are used in repair of nerve injury and also in repair of vascular anastomosis.

Advantage:

1. Its high inert property has made it also to be used in making mesh for hernia repair.
2. Higher tensile strength is high even upto 24 months.
3. Autoclaved even upto three times

Disadvantage:

1. Poor knotting property.

Uses:

1. Ideal for vascular anastomosis.
2. Best used for mesh repair in hernia repair
3. For tendon repir
4. For repair of nerve injuries

This is ideal for vascular anastomosis. This is used almost always in case of mesh repair of the posterior wall of the inguinal canal in case of herniorrhaphy. In fact, this polypropylene material is used in polypropylene mesh, which is mainly used in mesh repair. It is also used for repair of incisional hernias.

SKIN CLOSURE TECHNIQUES:

The skin closure plays a vital role in surgery for it is decides on the outlook of surgery and serves as a wound for the surgery done. Wound closure techniques has continued to evolve significantly over years and now a wide range of closure techniques from simple sutures to adhesive

compounds, and techniques have also improved. It is imperative to assess the wound and determine how best to treat the wound if in case the wound require further management so as to treat them at the best possible. There have been multiple techniques that can be used for wound closure. These include sutures, staples, and adhesives.

SUTURING METHOD:

Simple Everting Skin Stitch:

During skin closure techniques, eversion of the edges is desired method to be followed. when closing the skin. Hence, the suture bites are taken at deeper portion of the wound and the bite is taken wider apart than the superficial portion. When this stitch is tied, it is made sure that the edges of the wound are everted.

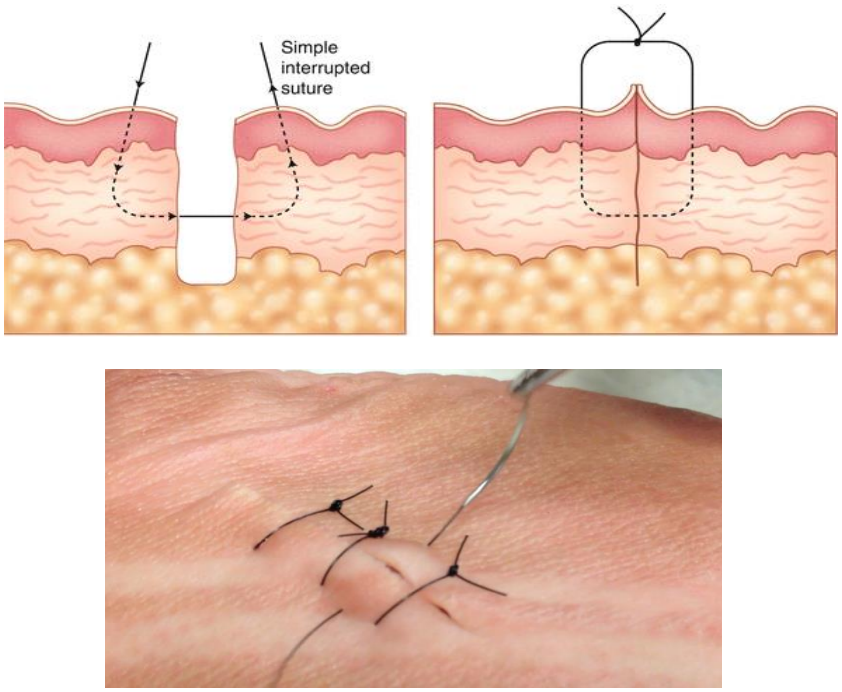


FIG 10: SIMPLE EVERTED SUTURE

Simple Interrupted Fascial Stitch :

This is the preferred wound closure technique for most of the skin incision. The suture bites are taken at depth of 8 – 10 mm in each bite for better closure. Time required is much less in this technique.

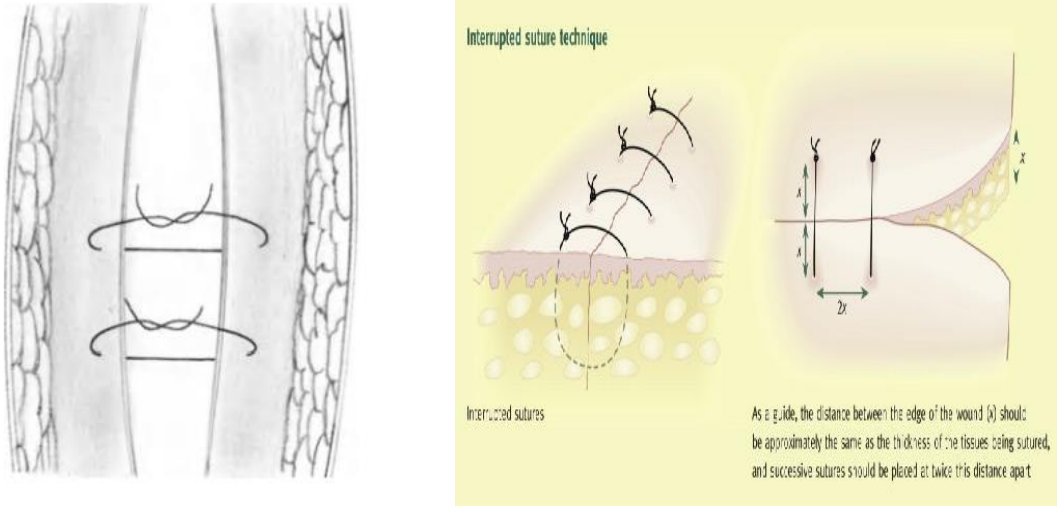


FIG 11: SIMPLE INTERRUPTED SUTURE

Continuous Subcuticular Stitch:

Continuous subcuticular suture technique is opted for a better cosmetic outcome of the skin wound. The suturing techniques is maximum opted with absorbable material where suture removal is not needed post – operatively. It can however be preferred with non – absorbable material. In case of non-absorbable suture material being used, suture removal is done 10 – 14 days post – operatively.

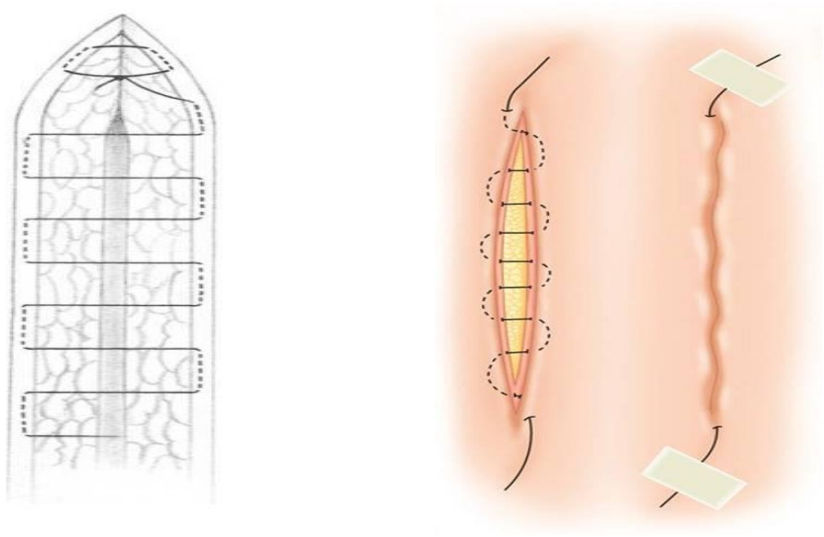


FIG 12: CONTINUOUS SUBCUTICULAR SUTURE

Continuous Simple Over-and-Over Stitch:

This method is opted for closure of mucosal layer of bowel anastomosis. It's also frequently used for closure of peritoneum.

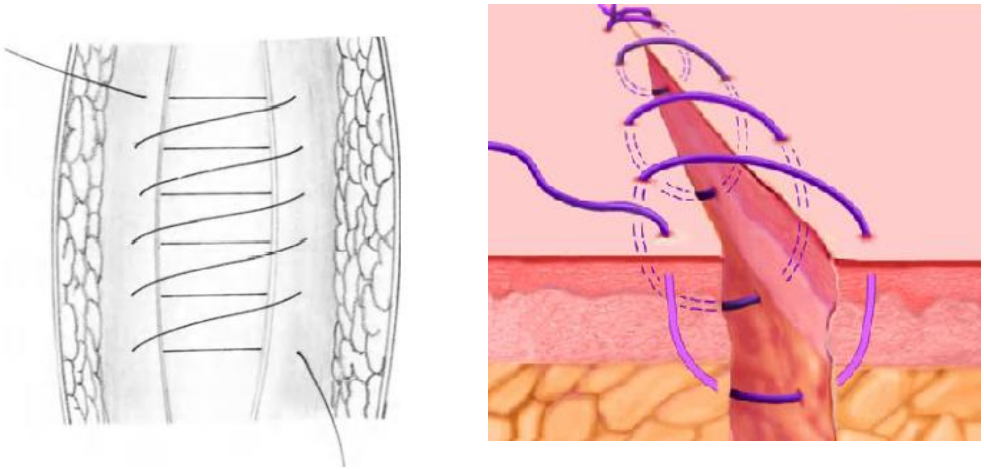


FIG 13: CONTINUOUS SUTURE

Continuous Locked Stitch:

This technique is used for approximation of the posterior mucosal layer of a bowel anastomosis which is by a continuous locking method. It has an

advantage to ensure perfect haemostasis. Simple over – and – over continuous stitch can be used for closure where haemostasis is not of prior.

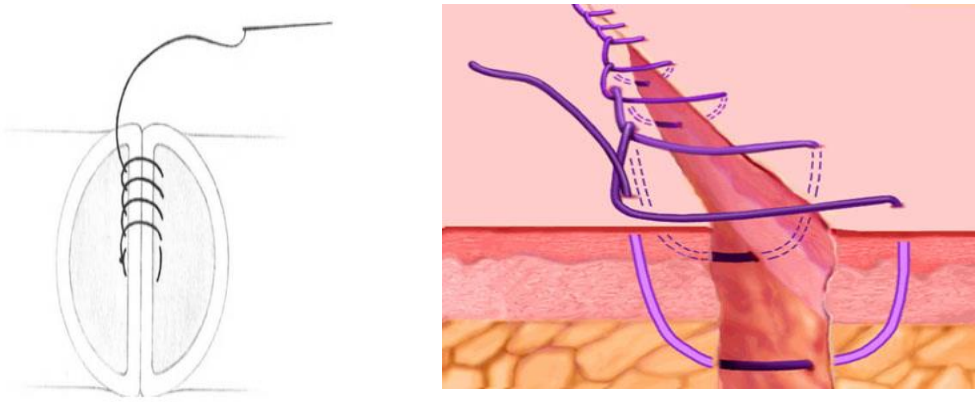
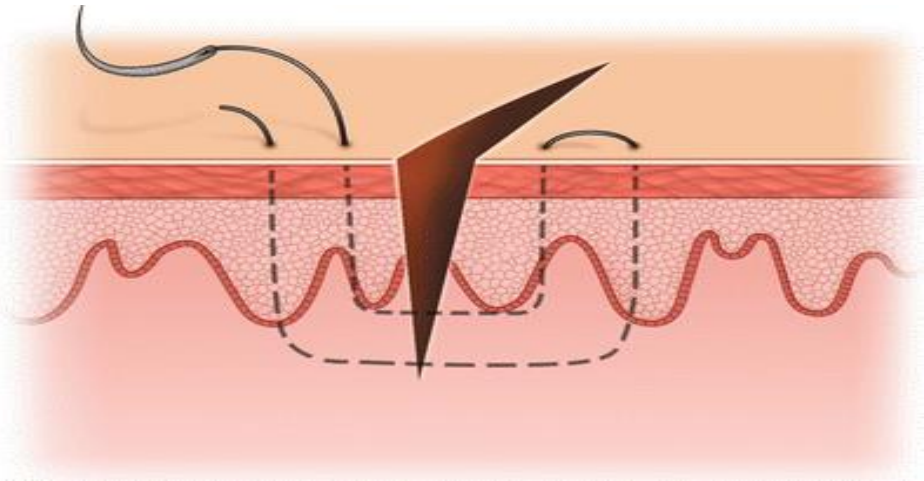


FIG 14: CONTINUOUS LOCKING SUTURE

Vertical Mattress (Stewart) Stitch:

The classic Stewart method of skin suturing, vertical mattress stitch itself makes the skin wound everted. Neither the simple sutures or vertical mattress should be tied with excess tension.



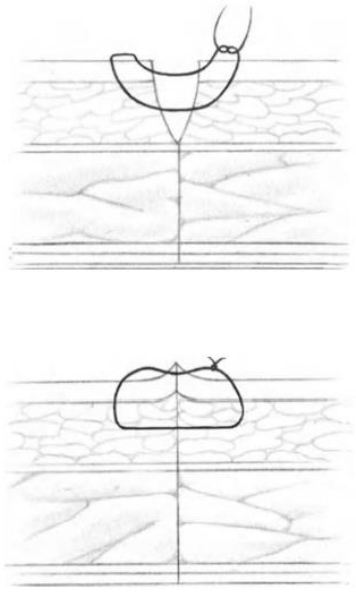


FIG 15: VERTICAL MATTRESS

Horizontal Mattress Stitch:

This type of suture serves as a haemostatic stitch. The mattress suture is occasionally used to close fascia and sometimes for ventral hernia

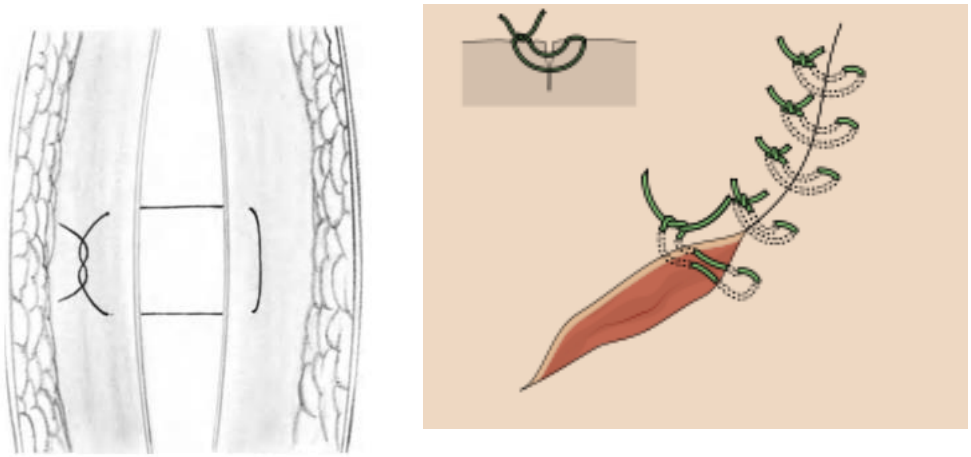


FIG 16: HORIZONTAL MATTRESS

Smead-Jones Stitch:

The Smead-Jones stitch is best opted suture for major abdominal incisions wound closure. It is a method of buried "retention" suture, as it includes all the abdominal layers excepting for the skin in the large loop. This is followed by a small loop with includes 4 – 5 mm of linea alba of both sides. This small loop is to orient the abdominal wall in perfect apposition.

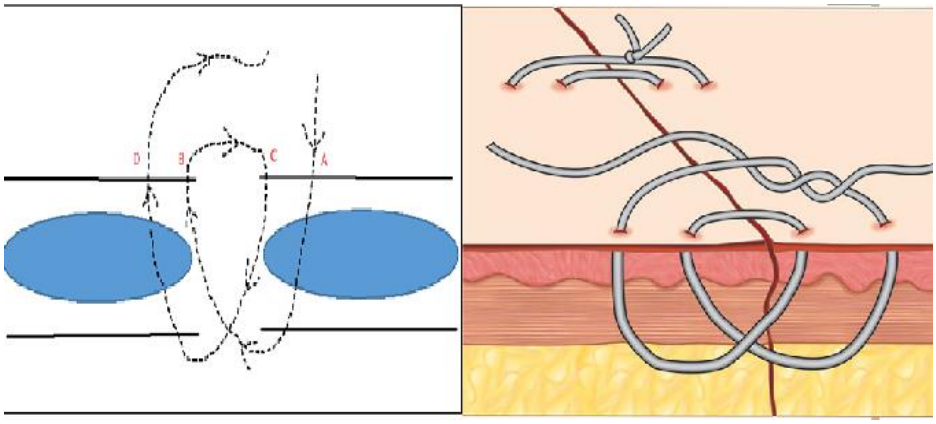


FIG 17: SMEAD – JONES TECHNIQUE

Haemostatic Figure-of-Eight Stitch:

This is the classic stitch used for occlusion of the bleeding vessels that retracts into the muscle or such similar type of structure. This is the commonly preferred haemostatic figure-of-eight stitch used in routine.

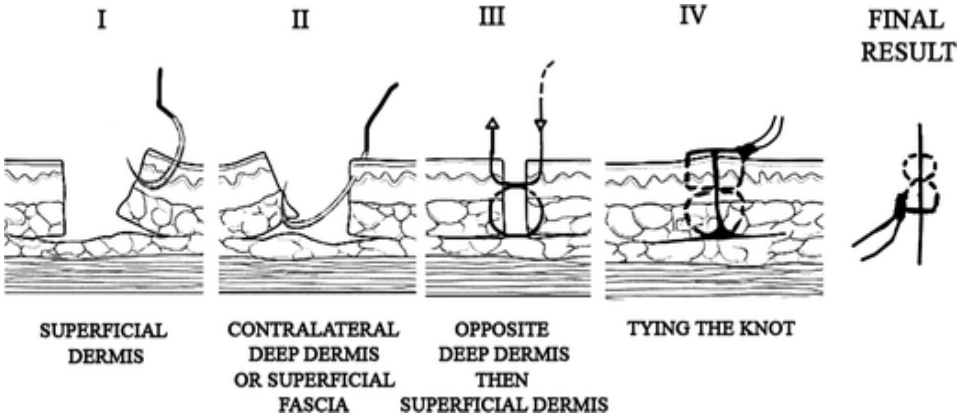


FIG 18: FIGURE OF EIGHT SUTURE

Single-Layer Bowel Anastomosis:

This type of suturing is also known as seromucosal stitch. It involves anastomosis of bowel in a single layer which is now acceptable. It is an effective method for achieving approximation and a minimal inversion of the wound, which is an inverting stitch that includes the seromuscular and submucosal layers and a small amount of mucosa. When properly application is achieved the wound actually gets slightly inverted in the mucosal layer on approximation. The stitch should not pass deeper than the submucosal layer. When this is used sin an interrupted or a continuous fashion, it serves as an alternate to the Connell stitch for achieving the inversion of the anterior mucosal layer in a two-layer bowel anastomosis technique. In case of single – layer intestinal anastomosis, it should be an interrupted closure technique which should be preferred.

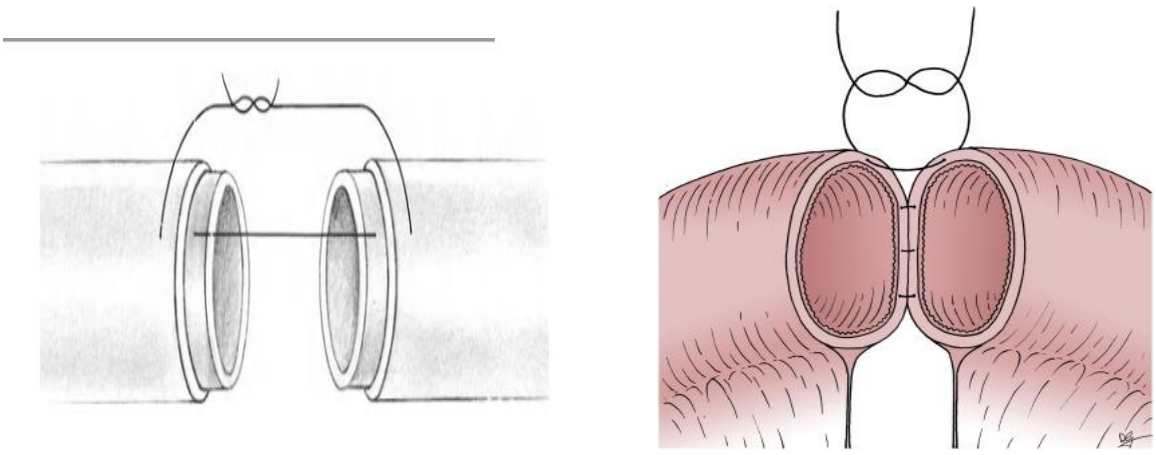


FIG 19: SINGLE LAYER BOWEL ANASTOMOSIS

Lembert Stitch:

This is the most commonly opted technique for approximation of seromuscular layer of bowel or gastric anastomosis. It includes about 5 mm of tissue which includes a bite of submucosa which later emerges 1–2 mm proximal to the cut edge of the serosa. This technique can be used for a single layer intestinal anastomosis. When applied in appropriate situation and methods this type of suture can be applied in a continuous fashion also.

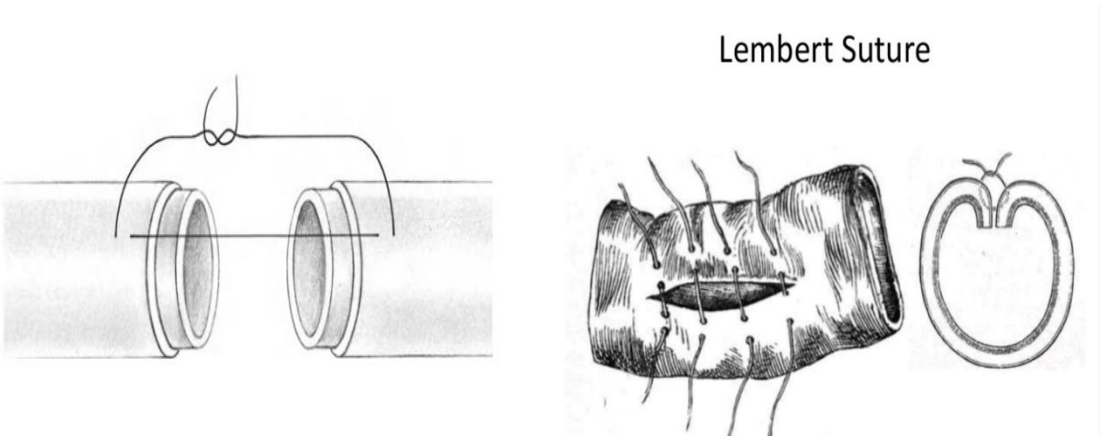


FIG 20: LEMBERT SUTURE

Cushing Stitch:

The Cushing stitch resembles the technique as that of the Lembert stitch, the difference is that the bites are inserted parallel to one another and 2–4 mm from the cut edge of the bowel. The bite should include about 5 mm of the bowel that should involve the submucosa. This technique is especially applicable to seromuscular bowel layer anastomosis and approximation in poorly accessible locations, namely the low colorectal anastomosis. The Cushing stitch is a good alternative to Connell stitch for approximation of

mucosal layer. The significant difference between the Connell stitch (see below) and a continuous Cushing suture is that in the Connell stitch it penetrates the lumen of the bowel and that is Cushing suture it passes only to the partial depth of the submucosal layer. The continuous Cushing suture more efficient and easier technique in comparison to the Connell stitch.

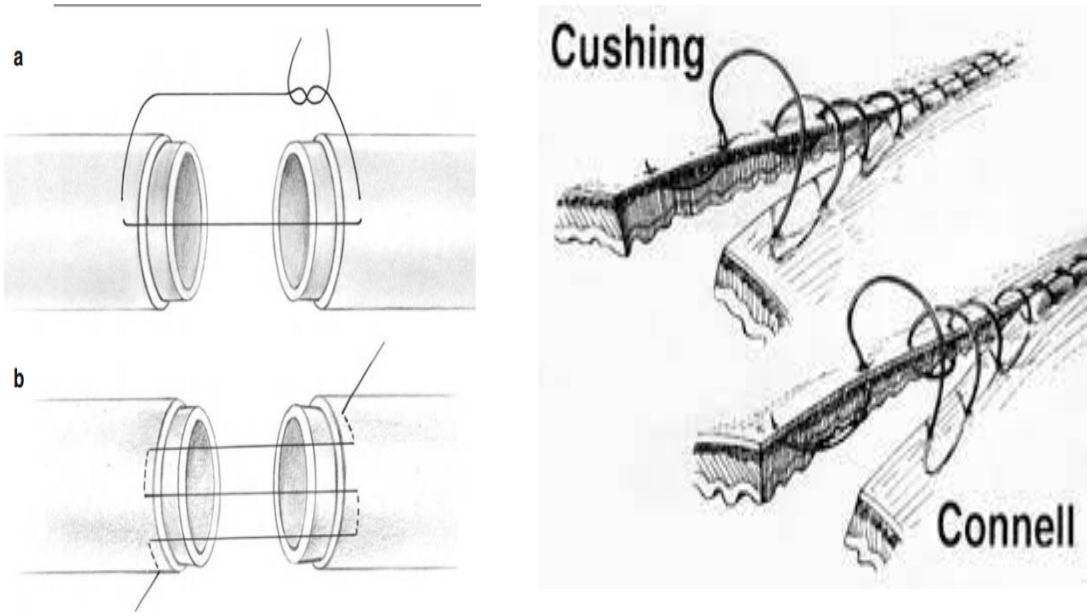


FIG 21: CUSHING SUTURE

Halsted Stitch:

The Halsted stitch in another technique that provides better seromuscular approximation for bowel anastomosis. It owes a disadvantage that when approximated with excess tension can cause strangulation than does Lembert's suture.

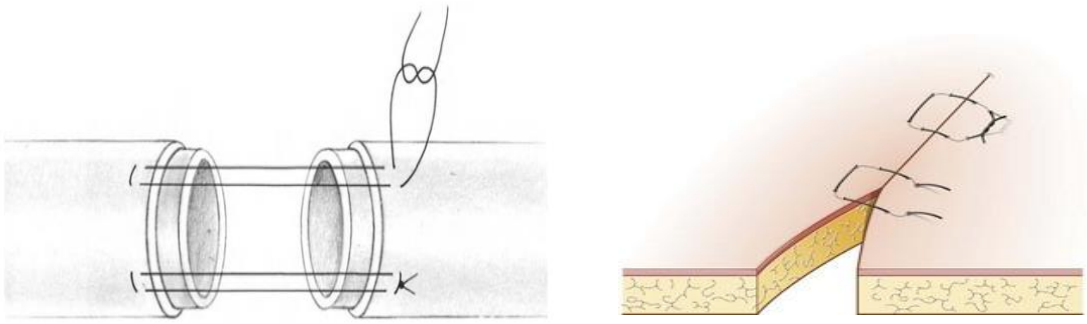


FIG 22: HALSTED SUTURE

Connell Stitch:

The Connell suture is technique of performing a single-layer end-to-end anastomosis of the bowel. This suture technique has always been used as method of closing anterior mucosal layer of a two - layer bowel anastomosis. The stitch is taken as a through and through manner including all the layers of intestine into lumen and comes out including all the layers on same side. It then passes over to the opposite segment of the bowel, in same manner. Because it forms a loop formed on the mucosa, the Connell stitch is used also as a partial haemostatic suture, however add on suture to arrest bleeder is required.

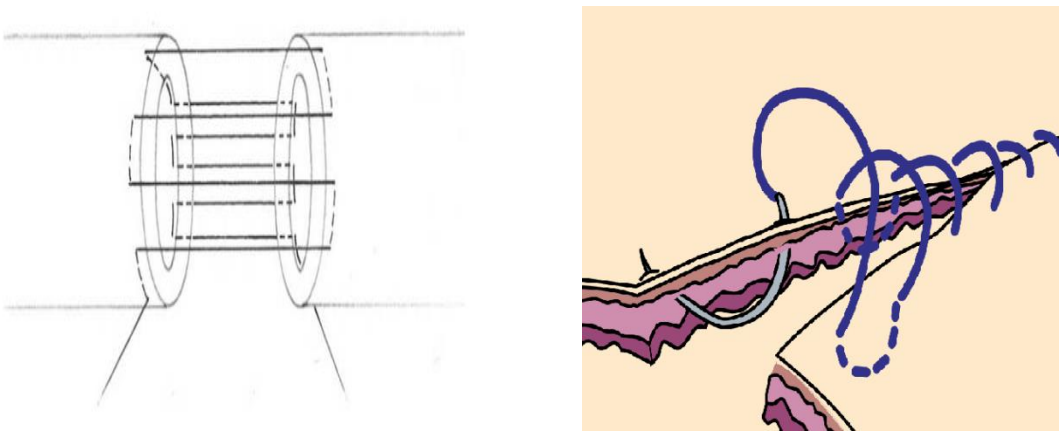


FIG 23: CONNELL SUTURE

Skin Staples:

Skin staples are newer technologies in practise for skin closure in this era, which saves time and with better cosmetic results. Staples are applied with force sufficient enough to approximate with excess tension to wound. Depending on the wound depth and underlying tissue staples are placed at 5 – 10 mm apart so as to minimise the tension created. The sutures are placed by aligning the skin edges to produce good apposition with slight eversion of the wound edges.

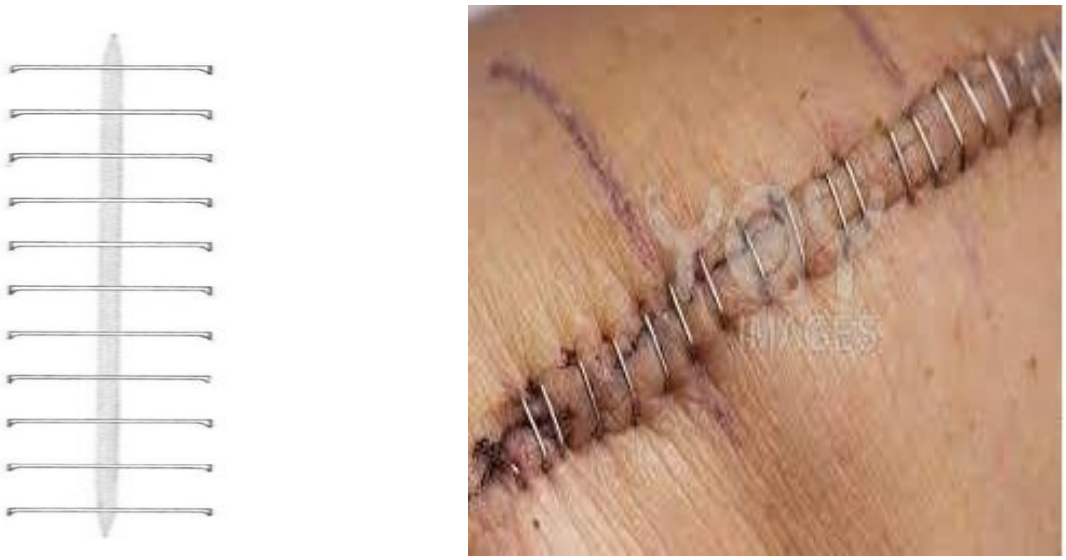


FIG 24: STAPLERS

MATERIALS AND METHODS

A total of 300 consecutive patients with viable pregnancies greater than 36 gestational weeks undergoing scheduled or unscheduled first caesarean delivery with low transverse incision were prospectively included between January2021- December2021 in patients getting admitted for delivery at a tertiary care hospital, Chennai. The study was carried out after obtaining the Institutional Ethical Committee clearance.

RANDOMIZATION*:* Computer generated block randomisation into the groups of prolene (polypropylene 25) and vicryl (polyglactin 910) suture material used in skin closure of patients undergoing caesarean operations.

To account for the possibility of up to 10% dropout or loss to follow-up, we set a target enrolment of 150 patients for each group. The analysis was conducted according to the intention-to-treat principle.

INCLUSION CRITERIA*:*

- Undergoing first section
- Gestational age >36 weeks

EXCLUSION CRITERIA:

- Gestational age <36 weeks
- Not willing to consent
- Fetal death
- Immunological disorder

- Implemented for non – routine procedure (midline skin incision, postpartum hysterectomy, relaprotomy)
- Loss to follow up

OPERATIVE TECHNIQUE:

The operating obstetrician will be blinded about the suture material and protocol of the study. Closure of the skin was performed by the attending physician who performed the operation and who did not have information about the study protocol.

- Preoperative surgical preparation followed hospital protocol. All women undergoing the procedure received preoperative prophylactic intravenous antibiotics within half an hour of skin incision. Pre-operative routine preparation included Suprapubic trichotomy, continuous bladder drainage and dorsal decubitus position for surgery was followed. All women will receive anyone type of neuraxial analgesia namely, spinal, epidural, or combined spinal and epidural. Degermation of the abdomen upto thigh root with chloroxedine 4% and after with chloroxedine alcohol. The surgical Opening technique followed was a routine Classic technique with Pfannestiel skin incision. The surgical procedure carried was same for both group upto to subcutaneous closure. Subcutaneous plane was closed with an interrupted sutures in all those cases where the subcutaneous tissue thickness was more than 2 cm with an absorbable suture material.

The Skin suture was performed with a subcuticular closure: GROUP I – vicryl absorbable suture, in the thickness of 1-0 and GROUP II – prolene nonabsorbable suture material, in the thickness of 1-0 followed by occlusive dressing. Analgesics were given upto two days post operatively. Nonabsorbable suture materials were removed at postoperative 7 to 10 days. Those patients included in the study were advised and educated about not to use any medication that would potentially impair the natural healing process of the wound. The surgical wound evaluations were initially performed on postoperative day 2 or 3 and at 6th week of follow-up. The primary outcomes of the study were complications related to wound healing (infection, dehiscence, hematoma, and hypertrophic scar formation) at 6th week of follow-up.

Secondary outcomes assessed in the study were such as healing rate of the wound, pain score on visual analog score (VAS), itching at scar site, cosmetic score was assessed. Post-operative pain was recorded by using Visual Analog Scale ranging from 0-10. The scaling was as 0- Best, 10-Worst at 48 hrs and at the time of discharge. Wound infection grades used were (0-4) as follows:

0- None

1- Erythema / Induration / Stich Abscess

2- Exudates / Subcutaneous Abscess

3- Partial dehiscence

4- Complete dehiscence

Cosmetic acceptability of scar was assessed at 6 weeks during follow up visit in the hospital. Scar assessment scale was Patient and Observer Scar Assessment Scale (POSAS).

The observer scale of the POSAS consists of six items

1. Vascularity,
2. Pigmentation,
3. Thickness,
4. Relief,
5. Pliability and
6. Surface area

The following variable had scored on a scale ranging from 1 (‘like normal skin’) to 10 (‘worst scar imaginable’). The individual variable had ratings and when summed up to total score ranging from 5–50 will be derived, with 5 representing normal skin. Meanwhile those patients in the study, blinded to the observers’ scar rating, were simultaneously were asked to provide ratings of their scars using the patient component of the POSAS on the same day as that of observers.

The Patient Scar Assessment Scale (PSAS) had 6 variable and they were

1. Pain,
2. Itchiness,

3. Colour,
4. Stiffness,
5. Thickness, and
6. Irregularity.

The individual variable carried a 10-point scoring system, which when summed obtained a total score ranging from 6 – 60, with 6 representing normal skin without any complaints.

Scars were categorized as

1. Mature (a light-colored, flat scar),
2. Immature (a red, occasionally itchy or painful, and slightly elevated scar),
3. Linear hypertrophic (a red, raised, itchy scar),
4. Minor keloid (a Locally raised, itchy scar), and
5. Major keloid (a large, raised scar greater than 0.5 cm, with or without pain, pruritus,)

Wound infection was defined as any discharge that would be serous to purulent, mild to severe that may require a daily dressing, need of change of antibiotic use and may or may not need re-suturing. Wound dehiscence was defined as a giveaway of skin edges which will be more than 1 cm in length and that may need re-suturing most often. Hematoma is defined as a wound swelling which would be more than 1 cm in diameter and can be accompanied by change in colour of the overlying skin. Hypertrophic scar was defined as a

pink-red coloured lesion which may characterised as anyone or more of the following hard, itchy, visible, and raised from the normal surrounding tissue.

Observer Scar Assessment Scale (OSAS)

	Normal skin	1	2	3	4	5	6	7	8	9	10	Worst scar imaginable
Vascularization		○	○	○	○	○	○	○	○	○	○	
Pigmentation		○	○	○	○	○	○	○	○	○	○	
Thickness		○	○	○	○	○	○	○	○	○	○	
Relief		○	○	○	○	○	○	○	○	○	○	
Pliability		○	○	○	○	○	○	○	○	○	○	

Patient Scar Assessment Scale (PSAS)

	No, not at all	1	2	3	4	5	6	7	8	9	10	Yes, very much
Is the scar painful?		○	○	○	○	○	○	○	○	○	○	
Is the scar itching?		○	○	○	○	○	○	○	○	○	○	
	No, as normal skin	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Yes, very different**
Is the scar color different from the color of your normal skin?		○	○	○	○	○	○	○	○	○	○	
Is the stiffness of the scar different from your normal skin?		○	○	○	○	○	○	○	○	○	○	
Is the thickness of the scar different from your normal skin?		○	○	○	○	○	○	○	○	○	○	
Is the scar more irregular than your normal skin?		○	○	○	○	○	○	○	○	○	○	

TABLE 1: OSAS & PSAS SCALE

RESULTS AND ANALYSIS

TABLE 2: AGE AND OTHER CLINICAL CHARACTERISTICS AMONG THE STUDY PARTICIPANTS (N=300)

Characteristics	Frequency (%)
Age group	
<25 years	108 (36)
26 -30 years	113 (37.6)
31-35 years	60 (20.0)
>35 years	19 (6.3)
Parity	
Primi	272 (90.8)
G2	26 (8.6)
G3 and above	2 (0.6)
Chronicity	
Singleton	275 (91.6)
Multiple	25 (8.4)
Gestational age	
Preterm	39 (13.0)
Term	238 (79.3)

Post term	23 (7.7)
Type of C section	
Emergency	249 (83.0)
Elective	51 (17.0)
Obstetric complications*	
Nil	203 (67.6)
GHTN / Preeclampsia / Eclampsia	64 (21.3)
GDM	35 (11.6)
Others	5 (1.6)
Medical illness*	
Nil	204 (68)
Hypothyroid	60 (20.0)
Asthma	10 (3.3)
Anemia	18 (6.0)
Others	15 (5.0)

*Multiple options possible

We could finally recruit 300 participants who fitted the inclusion criteria. Everyone agreed to participate in the study thus accounting for a response rate of 100%. We randomized them equally into the two arms (Vicryl and Prolene) using Block randomization. Table 1 depicts the clinical

characteristics of the study participants. We could see that almost one third (33%) of the study participants were belonging to the age group of 26-30 years. Almost 90% of the women who underwent C section were primi by parity. Around 92% of the study participants had singleton pregnancy. Almost 80% of the C section women who were included were term pregnancy, while around 83% were operated on an emergency basis. Majority of the study participants did not have any obstetric complications or any medical illnesses. The most commonly encountered obstetric complication was gestational hypertension (21%), while hypothyroidism was the most commonly encountered medical illness. The other less common obstetric complications were thrombocytopenia, and less common medical illnesses were polio, seizure disorder and psoriasis.

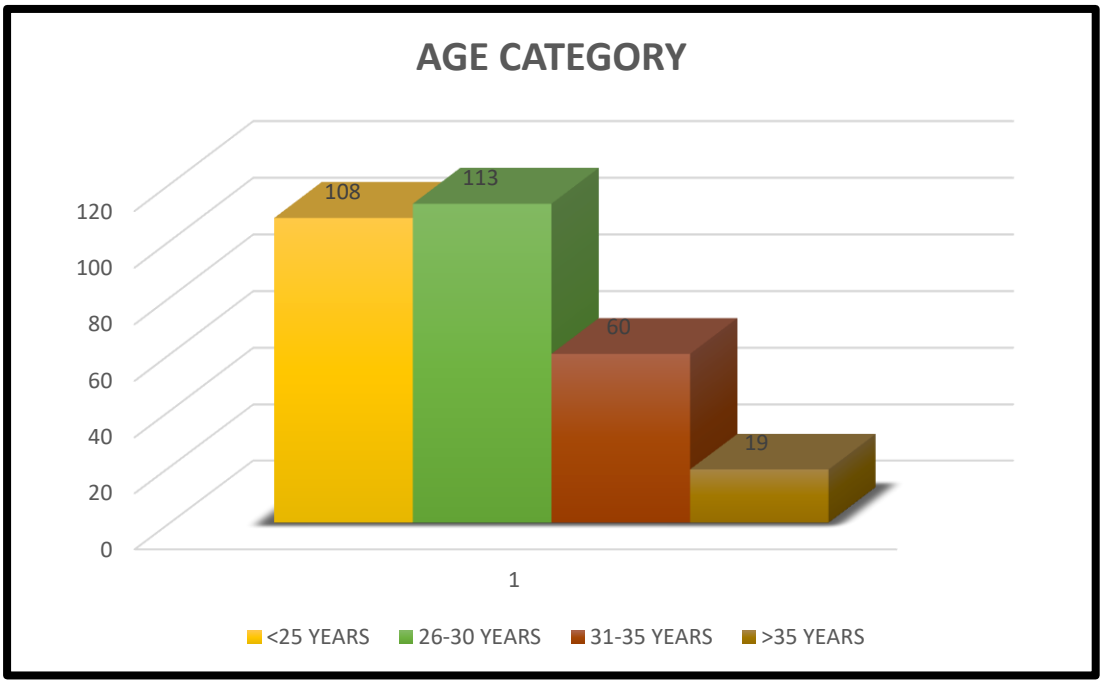


FIG 25: AGE DISTRIBUTION AMONG THE STUDY PARTICIPANTS

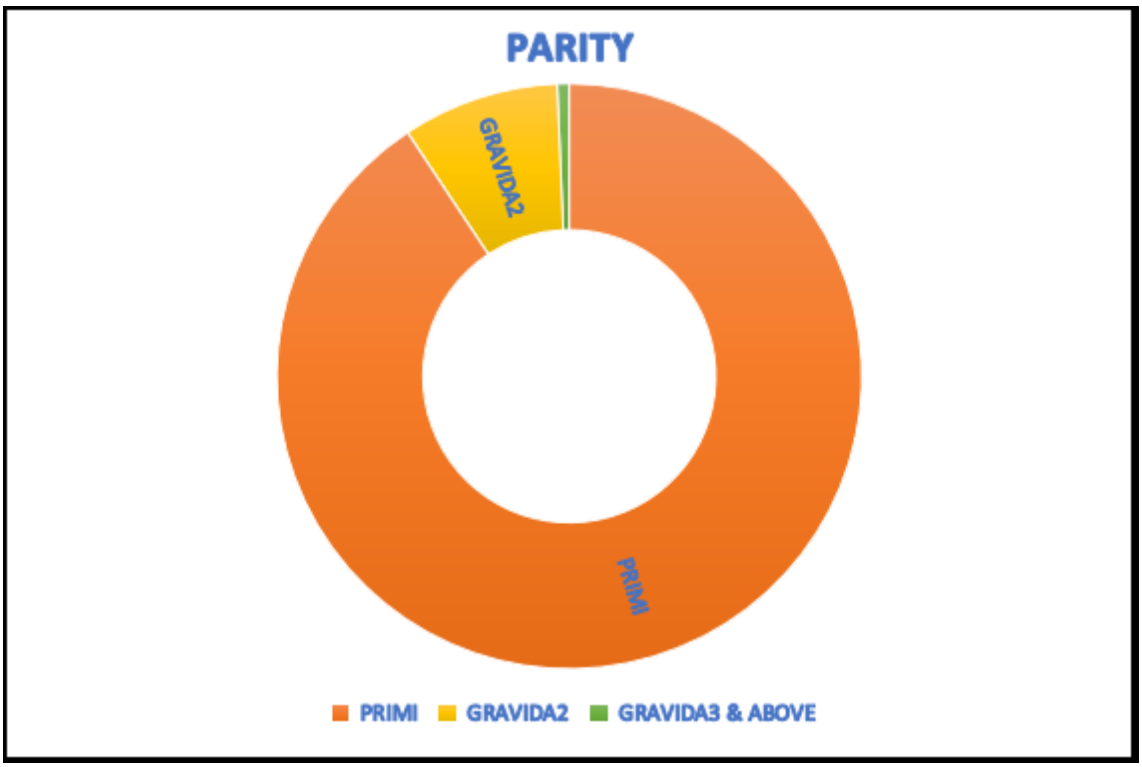


FIG 26: PARITY AMONG THE STUDY PARTICIPANTS

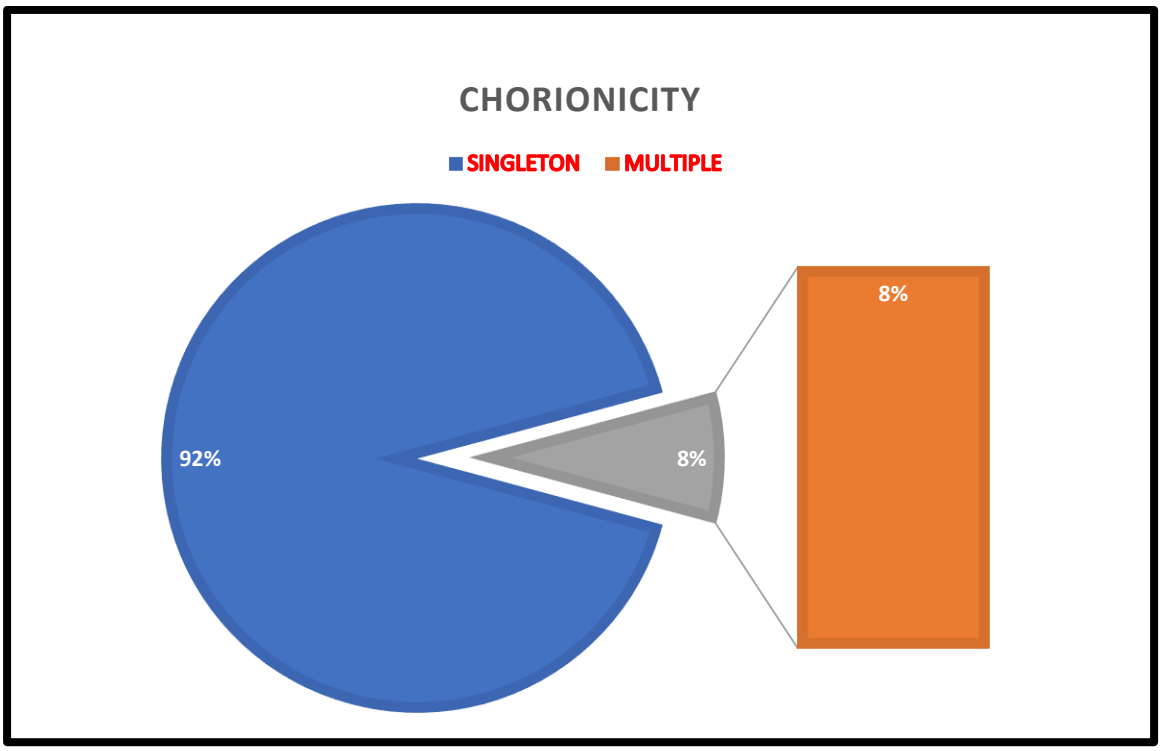


FIG 27: CHRONICITY AMONG THE STUDY PARTICIPANT

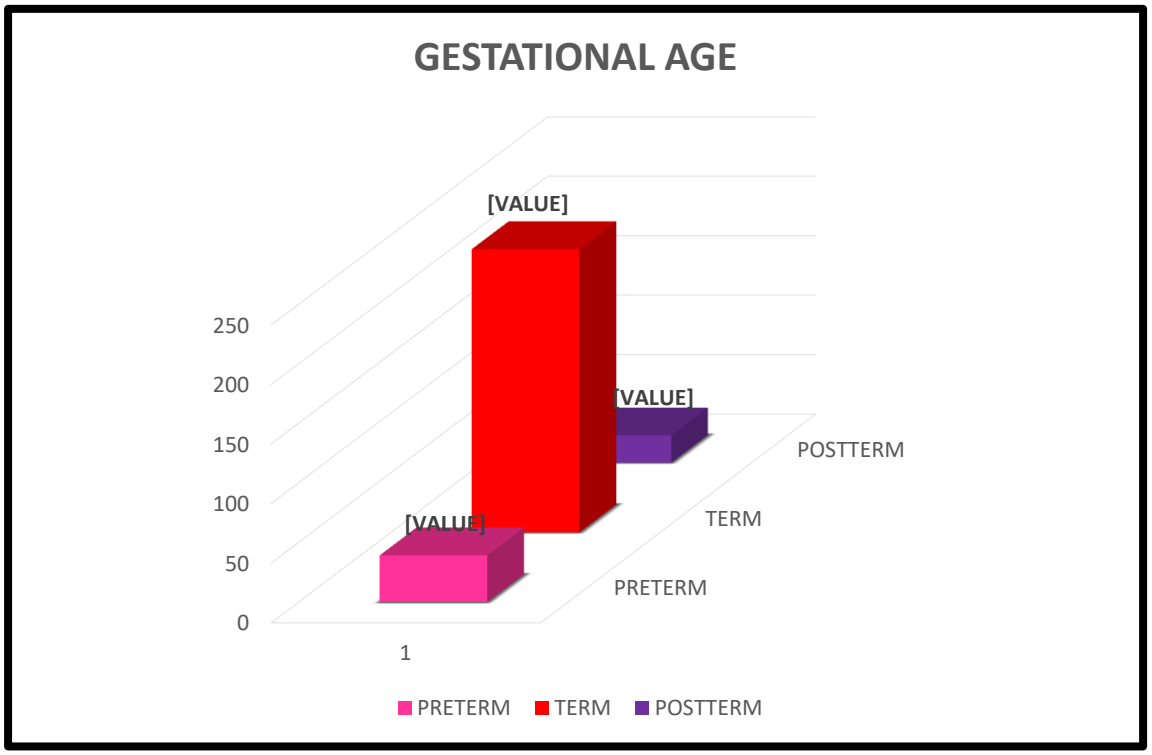


FIG 28: GESTATIONAL AGE AMONG THE STUDY PARTICIPANTS

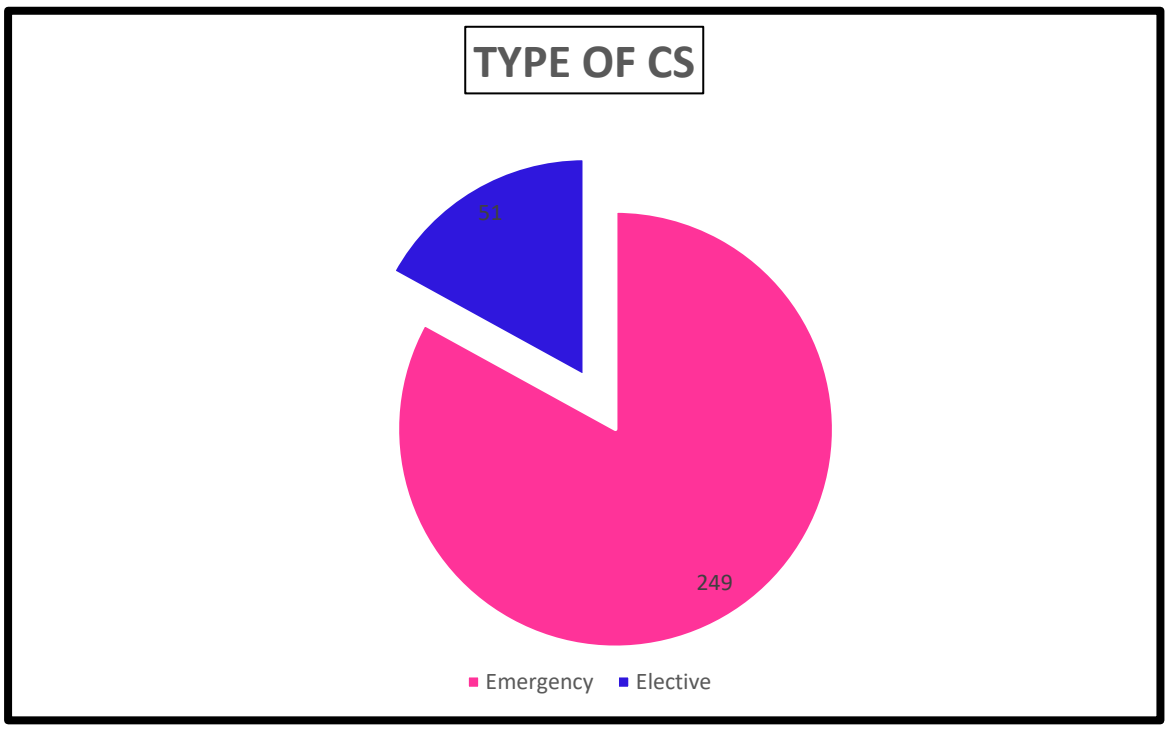


FIG 29: GENDER DISTRIBUTION AMONG THE STUDY GROUPS

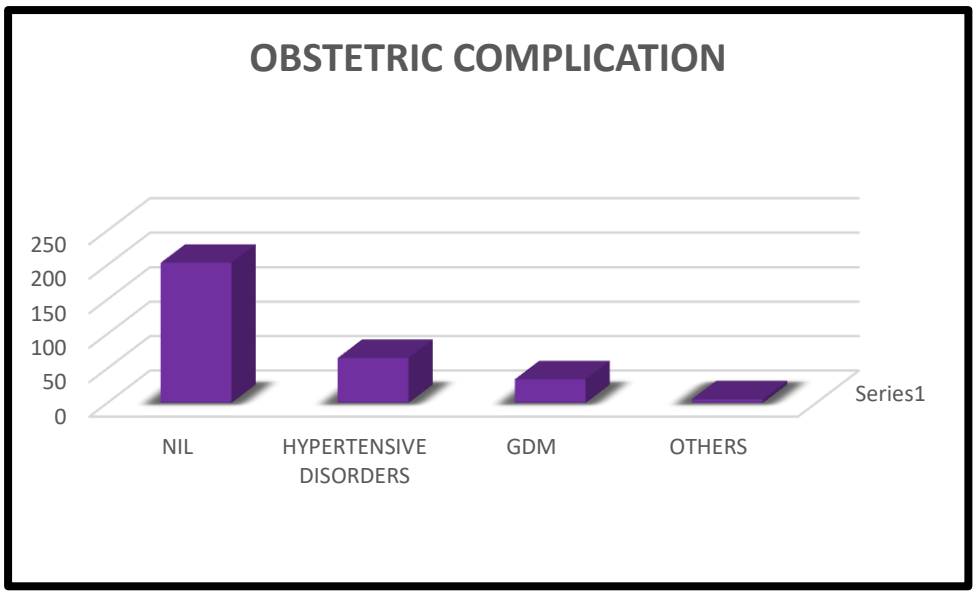


FIG 30: OBSTETRIC COMPLICATIONS AMONG THE STUDY PARTICIPANTS

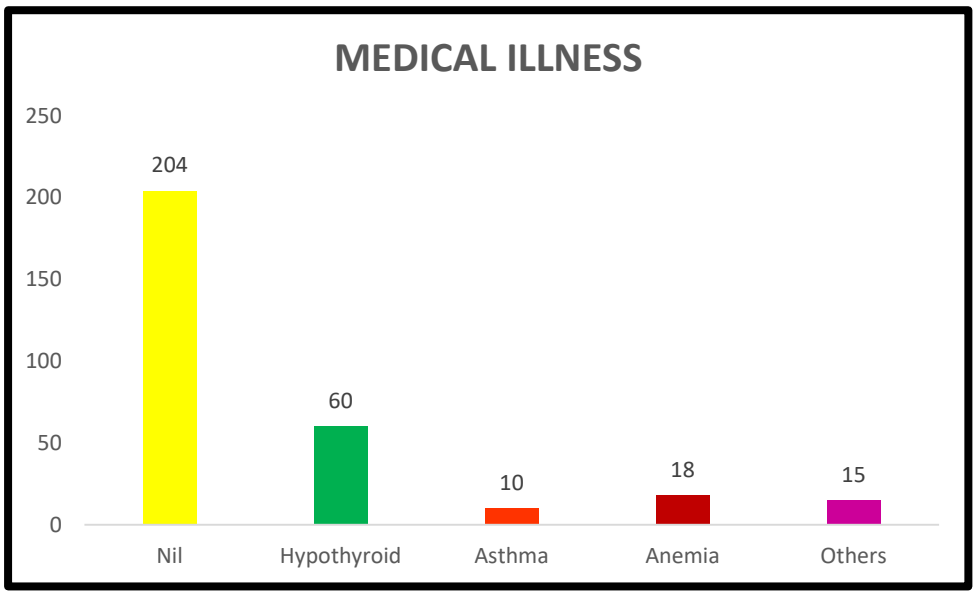


FIG 31: MEDICAL ILLNESS AMONG THE STUDY GROUPS

TABLE 3: COMPARISON OF BASELINE CHARACTERISTICS AMONG THE STUDY PARTICIPANTS ACROSS THE GROUPS (N=300)

Characteristics	**Vicryl**	**Prolene**	**P value**
Age group			
<25 years	53 (49.1)	55 (50.9)	0.35
26 -30 years	63 (55.8)	50 (43.2)	
31-35 years	25 (41.7)	35 (58.3)	
>35 years	9 (47.4)	10 (52.6)	
Parity			
Primi	134 (49.3)	138 (50.7)	0.71
G2	15 (57.7)	11 (42.3)	
G3 and above	1 (50.0)	1 (50.0)	
Chronicity			
Singleton	140 (50.9)	135 (49.1)	0.29
Multiple	10 (40.0)	15 (60.0)	
Gestational age			
Preterm	17 (43.6)	22 (56.4)	0.59
Term	120 (50.4)	118 (49.6)	
Post term	13 (56.5)	10 (43.5)	
Type of CS			
Emergency	126 (50.6)	123 (49.4)	0.64
Elective	24 (47.1)	27 (52.9)	

Table 3 explains the baseline comparison of the clinical characteristics between the study groups. We observed that the study groups were comparable with no significant difference with respect to the baseline study characteristics. (p value > 0.05)

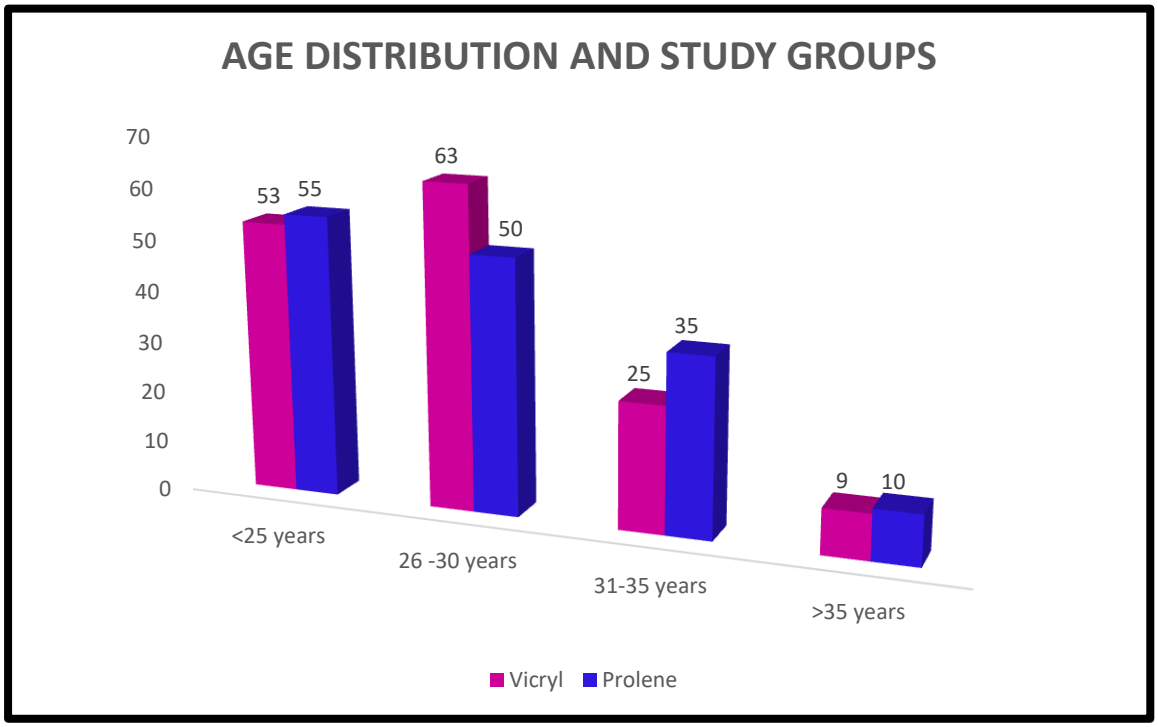


FIG 32: AGE DISTRIBUTION AMONG THE STUDY GROUPS

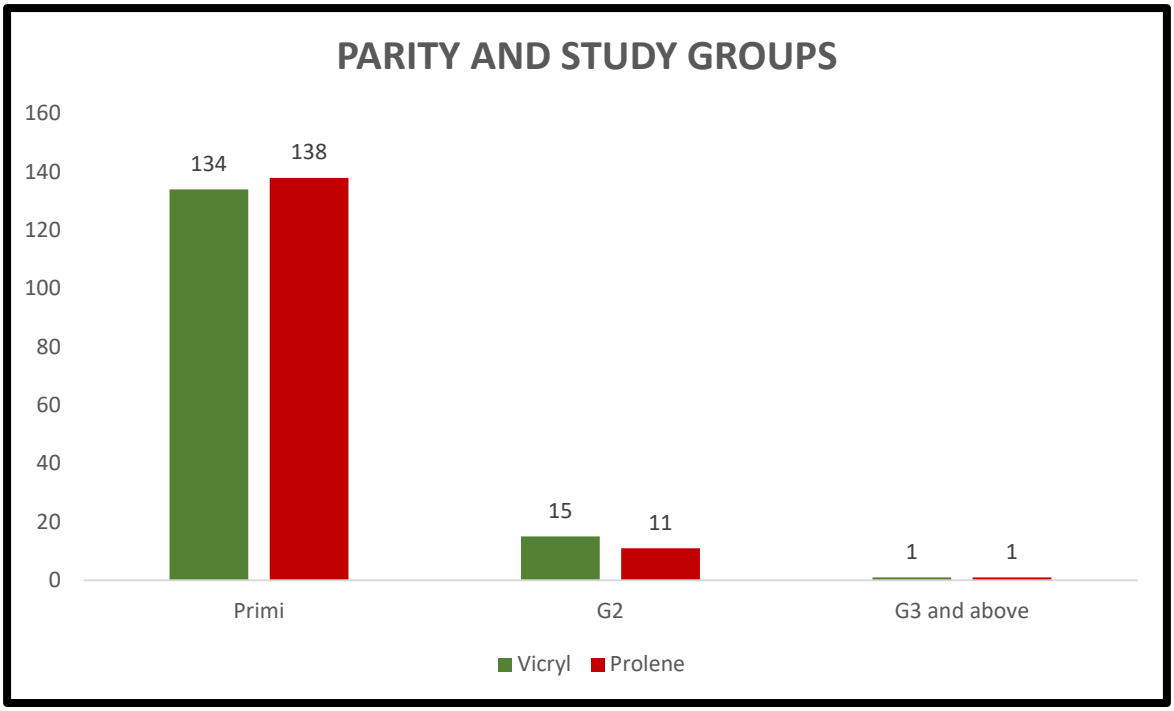


FIG 33: PARITY AMONG THE STUDY GROUPS

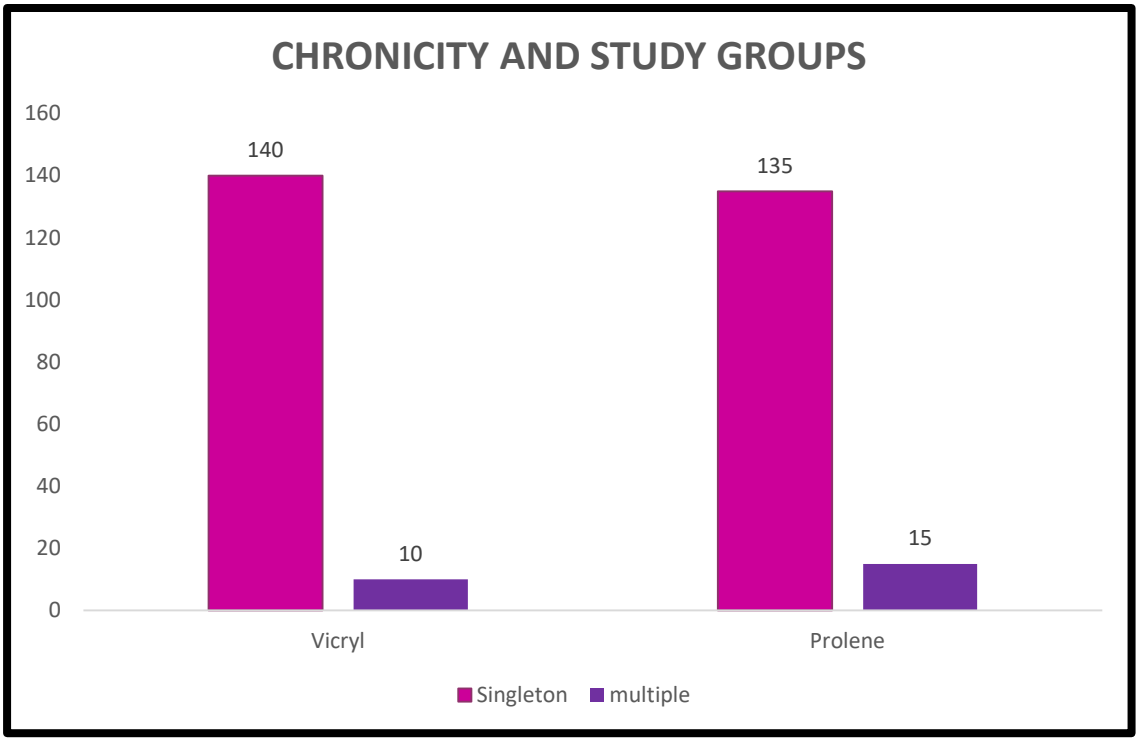


FIG 34: CHRONICITY AMONG THE STUDY GROUPS

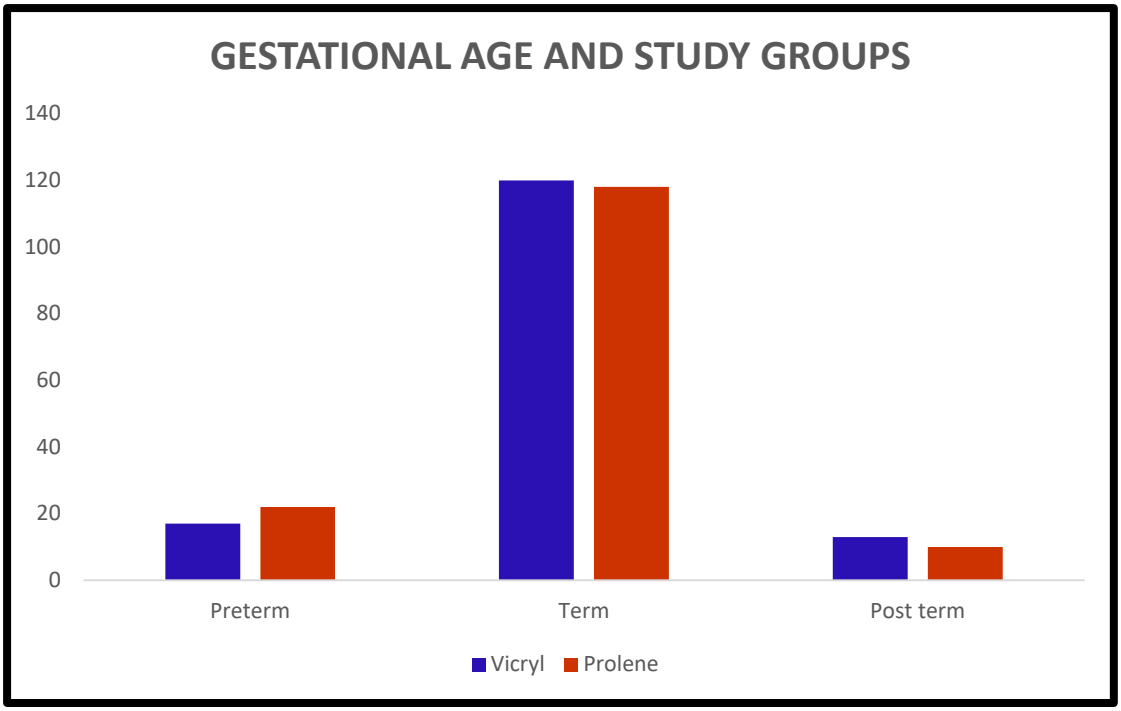


FIG 35: GESTATIONAL AGE AMONG THE STUDY GROUPS

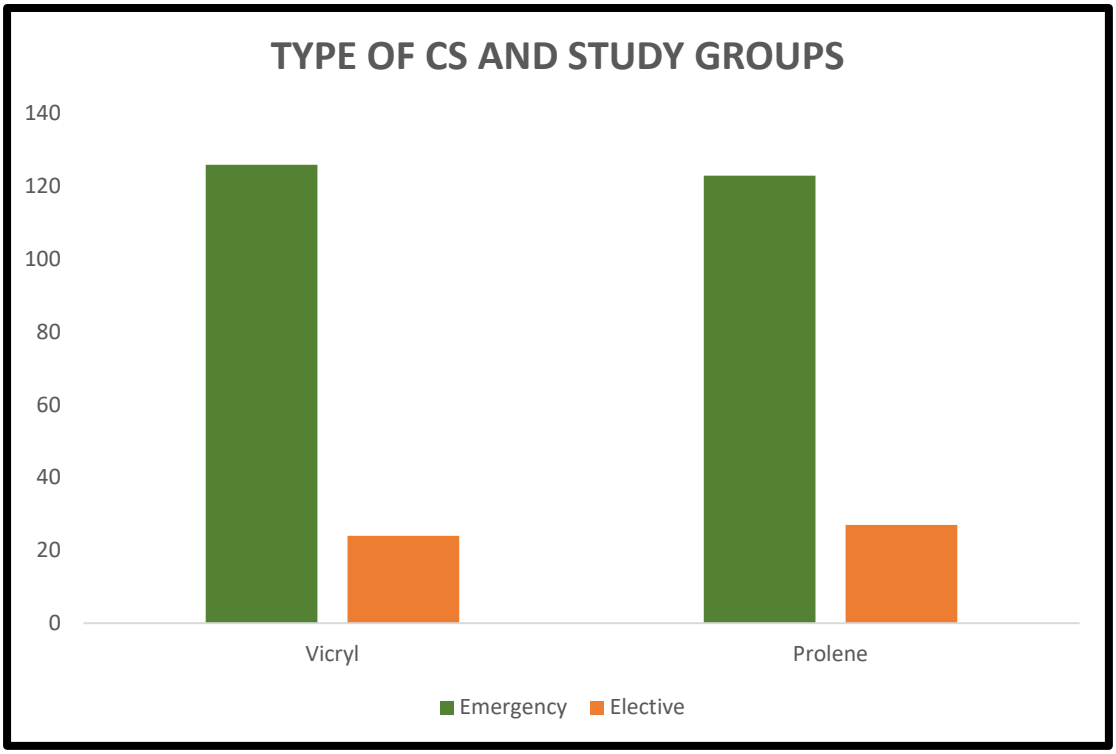


FIG 36: TYPE OF CS AMONG THE STUDY GROUPS

TABLE 4: NEED OF CHANGE OF ANTIBIOTIC AND RE-SUTURING AMONG THE STUDY PARTICIPANTS ACROSS THE GROUPS (N=300)

Change of antibiotic	Vicryl	Prolene	P value
Yes	2 (11.7)	15 (88.3)	<0.001
No	148 (51.2)	135 (48.8)	
Need of re-suturing			
Yes	0 (0.0)	6 (100)	0.01
No	150 (50.3)	144 (49.6)	

Table 4 depicts the need to change of antibiotic and re-suturing among the study participants across the groups. It was observed that the need of change of antibiotic was way much less in vicryl group than that of prolene group. We also observed that the vicryl group patient had not been subjected to undergo re-suturing. Among 150 study participants in the prolene group, 6 patients were subjected to undergo wound re-suturing. Of them 2 patients had complete wound gapping while the remaining 4 patients had partial dehiscence, however they were also subjected to re-suturing. Thus, the complication rates when compared was more among the prolene group than that of vicryl study participants.

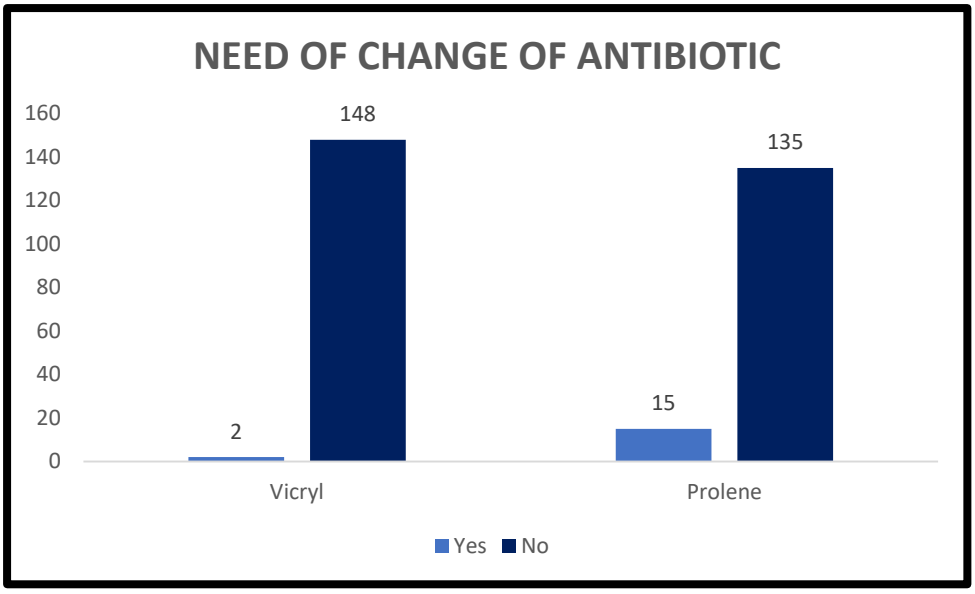


FIG 37: CHANGE OF ANTIBIOTIC AMONG THE STUDY GROUPS

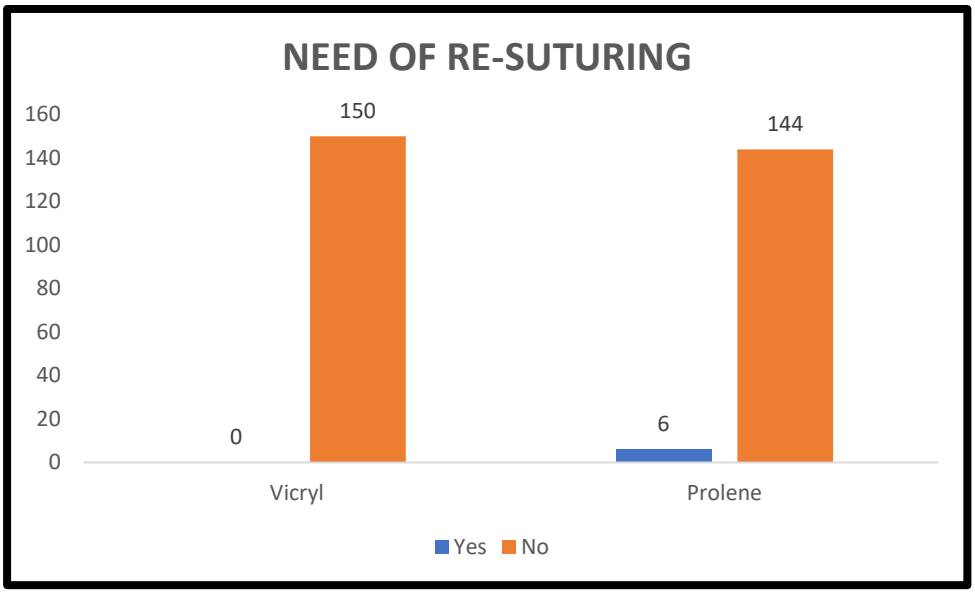


FIG 38: NEED OF RE-SUTURING AMONG THE STUDY GROUPS

For the outcome analysis, we analyzed the difference across the patient and observer scar assessment scales with respect to the study groups. We used students t test to test the difference across these values among the groups. A p-value of <0.05 was considered as significant.

TABLE 5: DIFFERENCE IN PSAS AND OSAS SCORES ACROSS THE STUDY GROUPS (N=300)

Characteristics	**Vicryl Mean (SD)**	**Prolene Mean (SD)**	**P value**
PSAS	11.72 (4.2)	14.2 (5.5)	0.001
Heart rate after induction	8.1 (3.1)	9.5 (4.3)	<0.001

Table 5 describes the difference in PSAS and OSAS scores across the study groups. We observed a significant difference with respect to the mean (SD) scores obtained across the vicryl and prolene groups for both PSAS and OSAS scores. (P value <0.001) We also observed that the study participants in the vicryl group had more PSAS and OSAS scores when compared to the prolene group.

TABLE 6: DISTRIBUTION OF OBSERVER EXAMINATION FINDINGS ACROSS THE STUDY GROUPS*

Observer findings	**Vicryl**	**Prolene**	**P value**
Nil	139 (69.5)	88 (30.5)	0.05
Erythema	4 (8.5)	31 (91.5)	
Induration	21 (94.3)	2 (5.7)	
Stitch abscess	0 (0.0)	1 (100.0)	
Exudate	1 (20.0)	4 (80.0)	
Partial dehiscence	0(0.0)	2 (100.0)	
Complete dehiscence	0 (0.0)	0 (0.0)	
Pigmentation	3 (15.0)	12 (85.0)	

*Multiple options possible

Table 6 describes the distribution of observer examination findings across the study groups. We found that the distribution observer examination findings were found to be statistically significant across the study groups. (p value

0.05) Almost 2/3rd of the study participants never had any complication as such. However, though the complication rate was more among the prolene study group, the vicryl group had complication of reporting a high number of induration and itching as a complaint among the study participants. The same was the correlational finding among the observer findings. Thus, vicryl however carried a disadvantage of reporting more of induration among the study participants even though, the din't report any wound dehiscence among them.

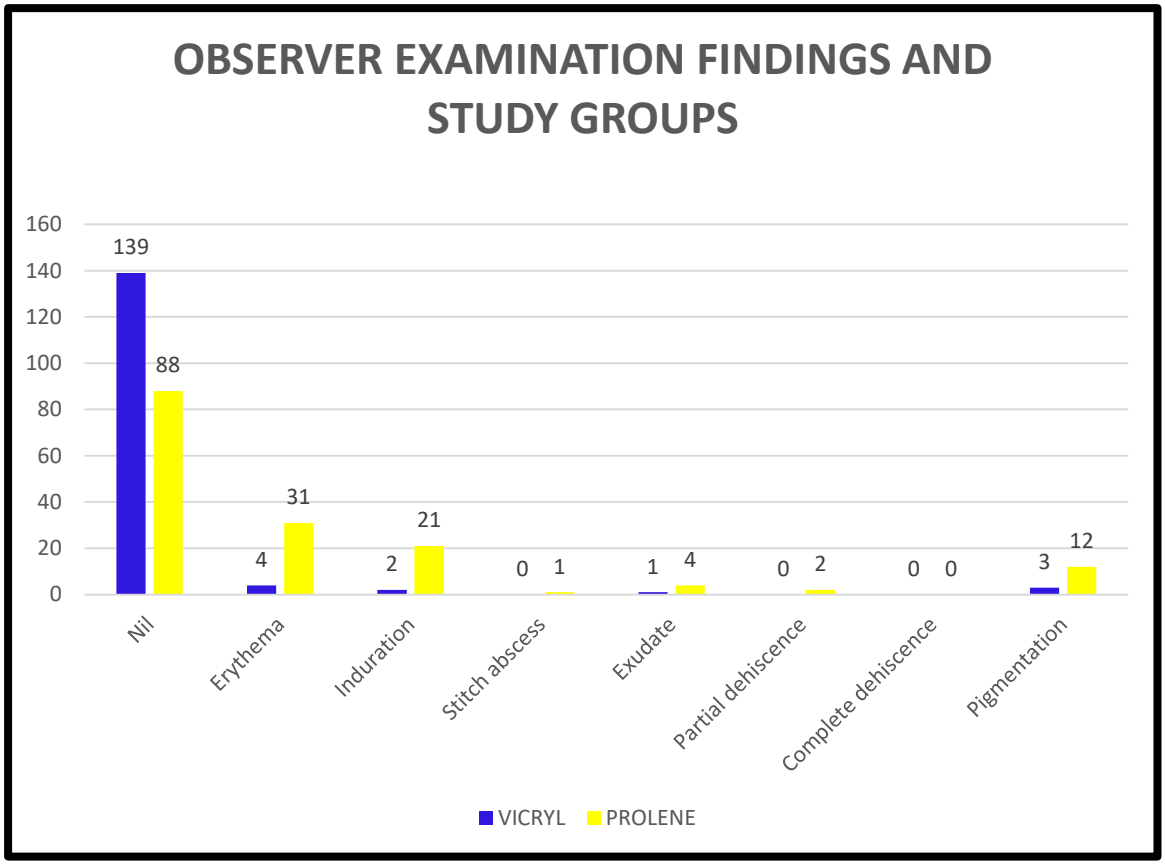


FIG 39: DISTRIBUTION OF OBSERVER EXAMINATION FINDINGS ACROSS THE STUDY GROUPS

TABLE 6: DISTRIBUTION OF PATIENT COMPLAINTS ACROSS THE STUDY GROUPS*

Patient complaints	**Vicryl**	**Prolene**	**P value**
Nil	86 (61.9)	53 (38.1)	<0.001
Pain	23 (25.0)	69(75.0)	
Itching	41 (82.0)	9(18.0)	
Pliability	1 (50.0)	1 (50.0)	
Hypertrophy	2 (10.0)	18 (90.0)	
Vascularization	6(33.3)	12(66.7)	

*Multiple options possible

Table 5 describes the distribution of patient complaints across the study groups. We found that the distribution patient complaints were found to be statistically significant across the study groups. (p value <0.001) Almost half of the study participants never had any complication as such, while pain was the most commonly observed examination patient complaint among the prolene group, itching and induration was the most frequent complaint among patients who were used vicryl for skin closure. The prolene group also had a significant number of participants reporting with complaints of wound hypertrophy in their follow up compared to the vicryl group.

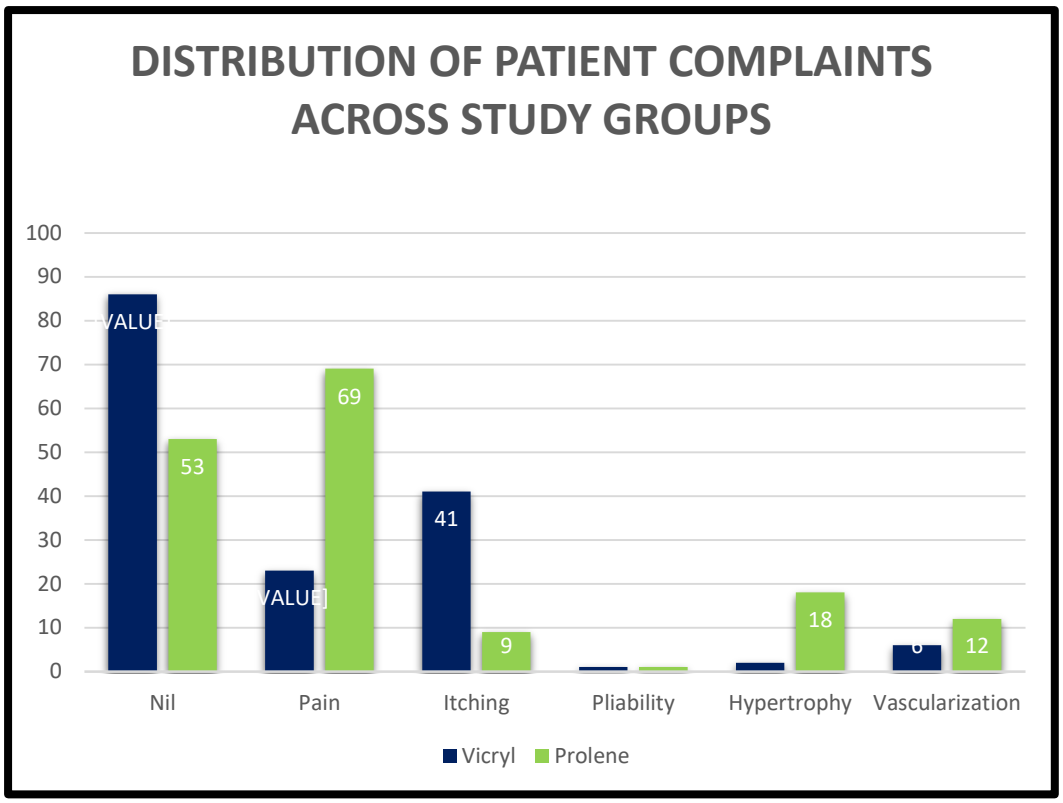


FIG 40: DISTRIBUTION OF PATIENT COMPLAINTS ACROSS THE STUDY GROUPS*

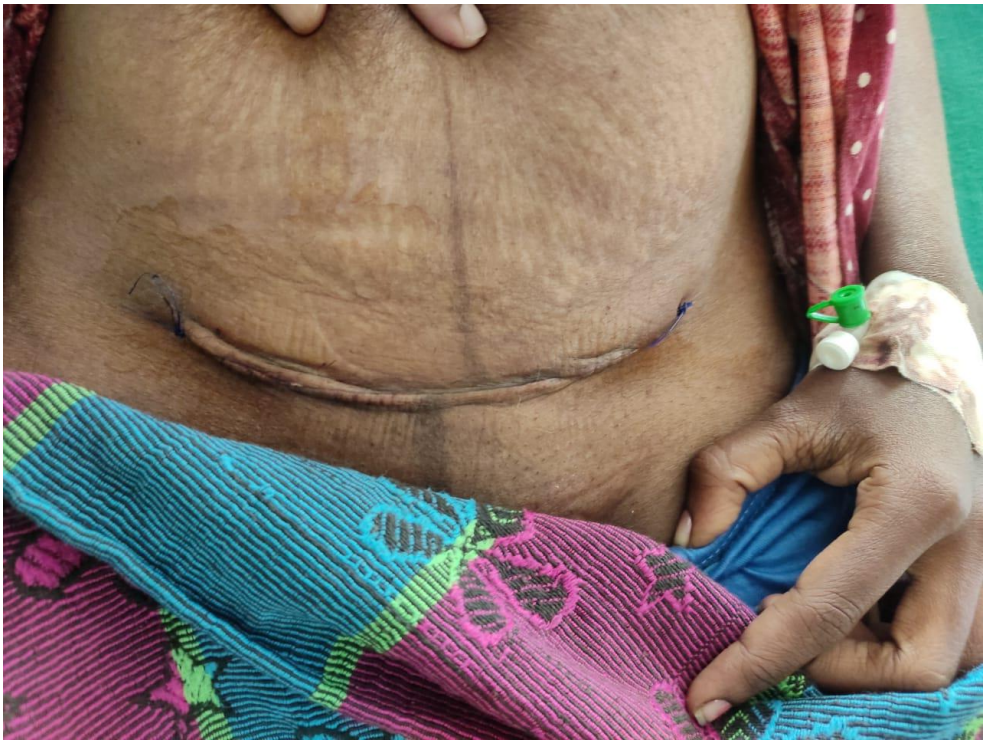


FIG 41: PROLENE POD 2

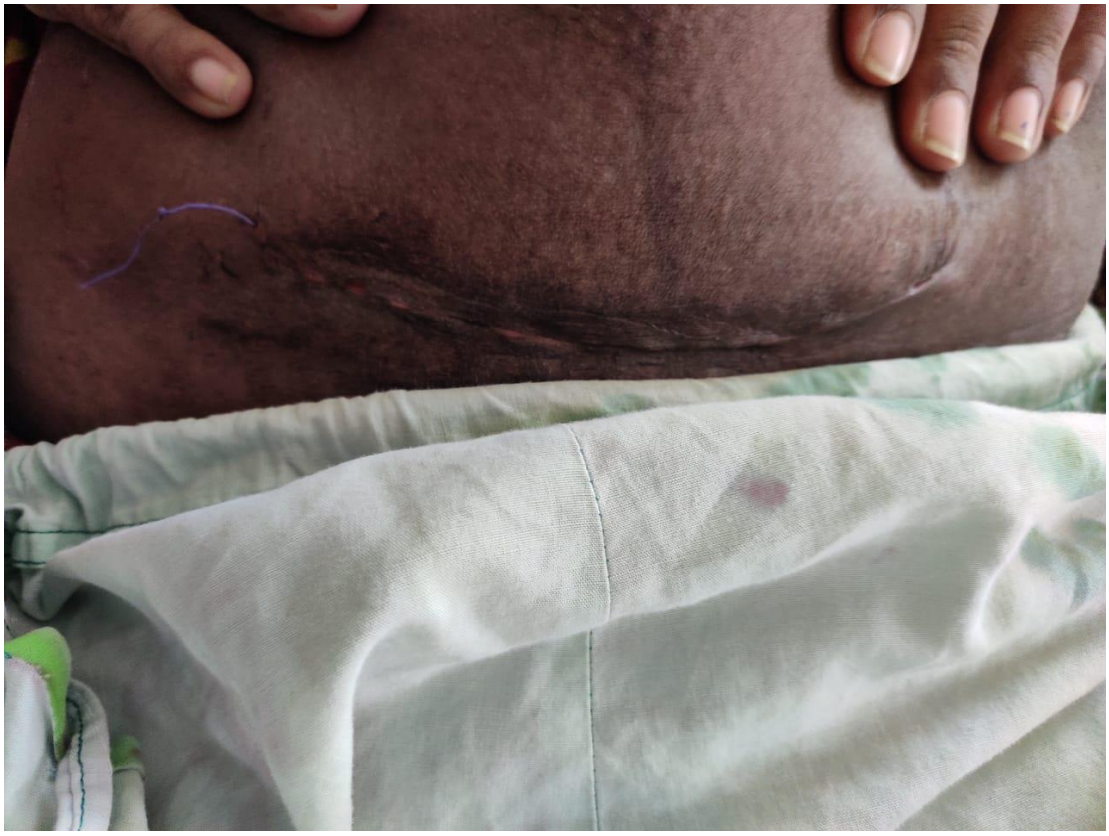


FIG 42: VICRYL POD – 2

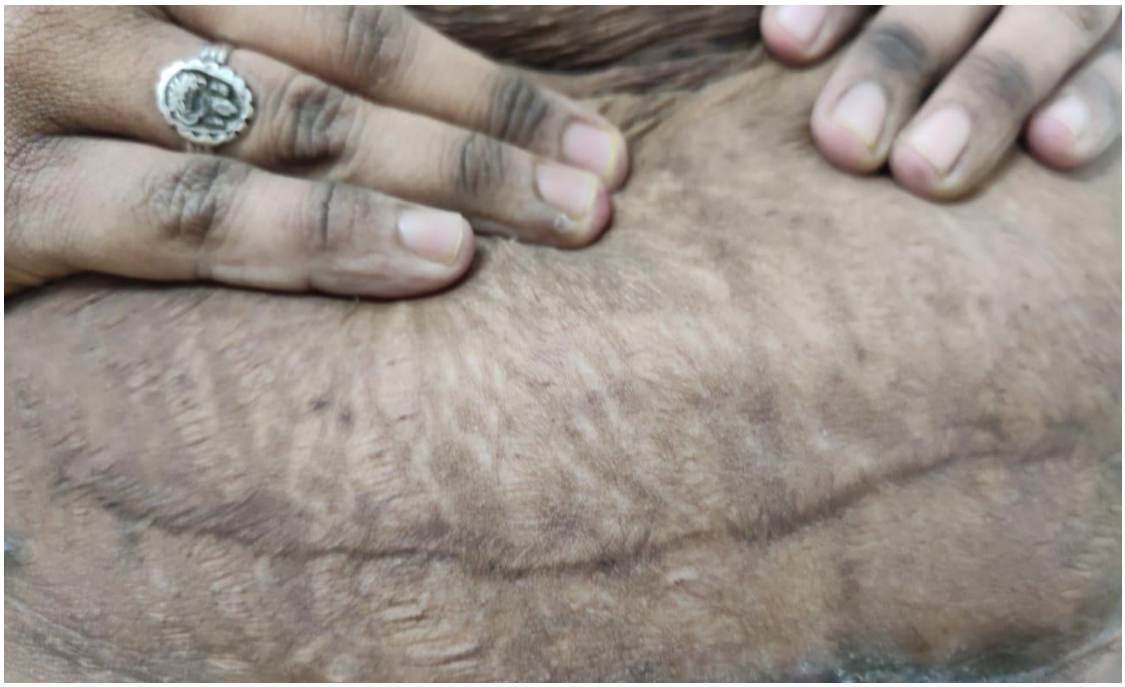


FIG 43: PROLENE 6TH WEEK

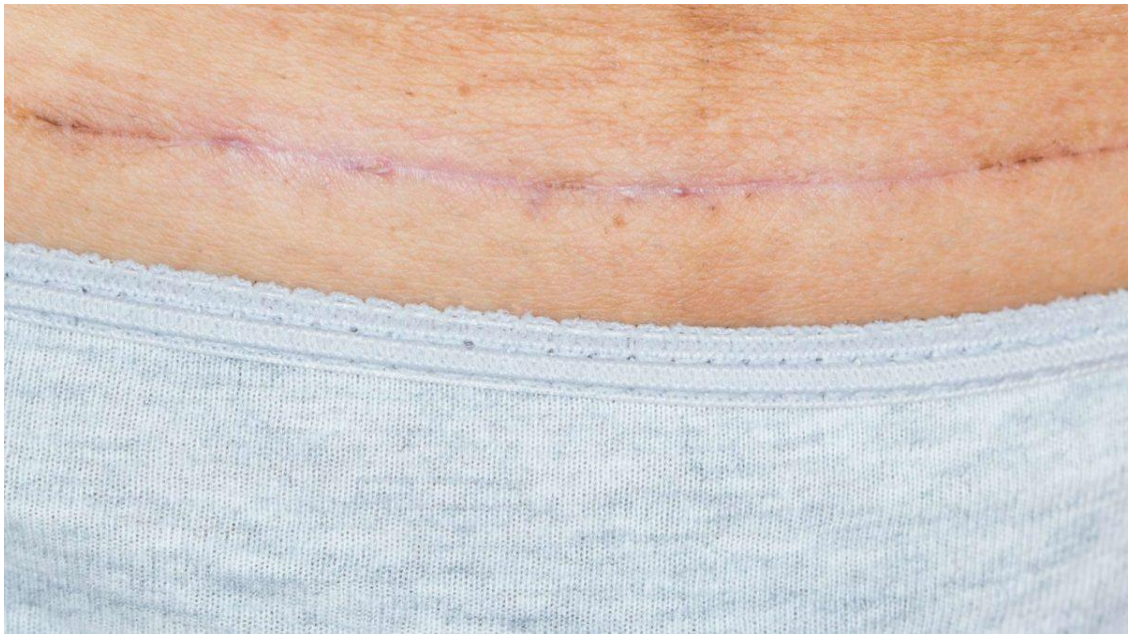


FIG 44: VICRYL 6TH WEEK

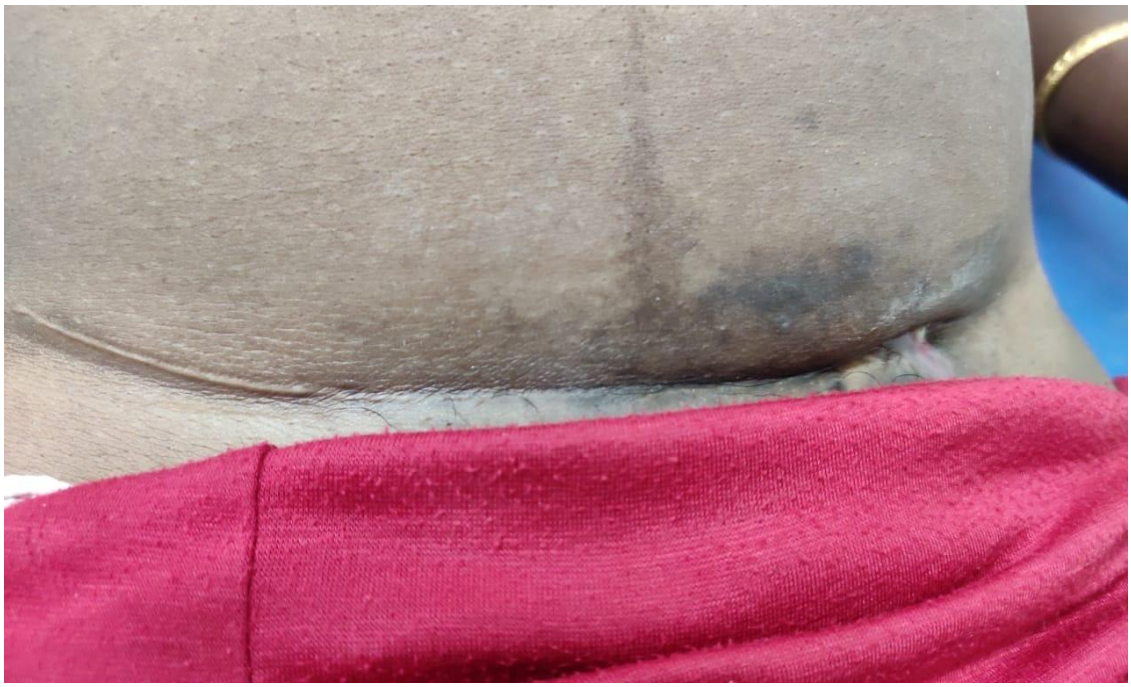


FIG 45: STITCH ABCESS

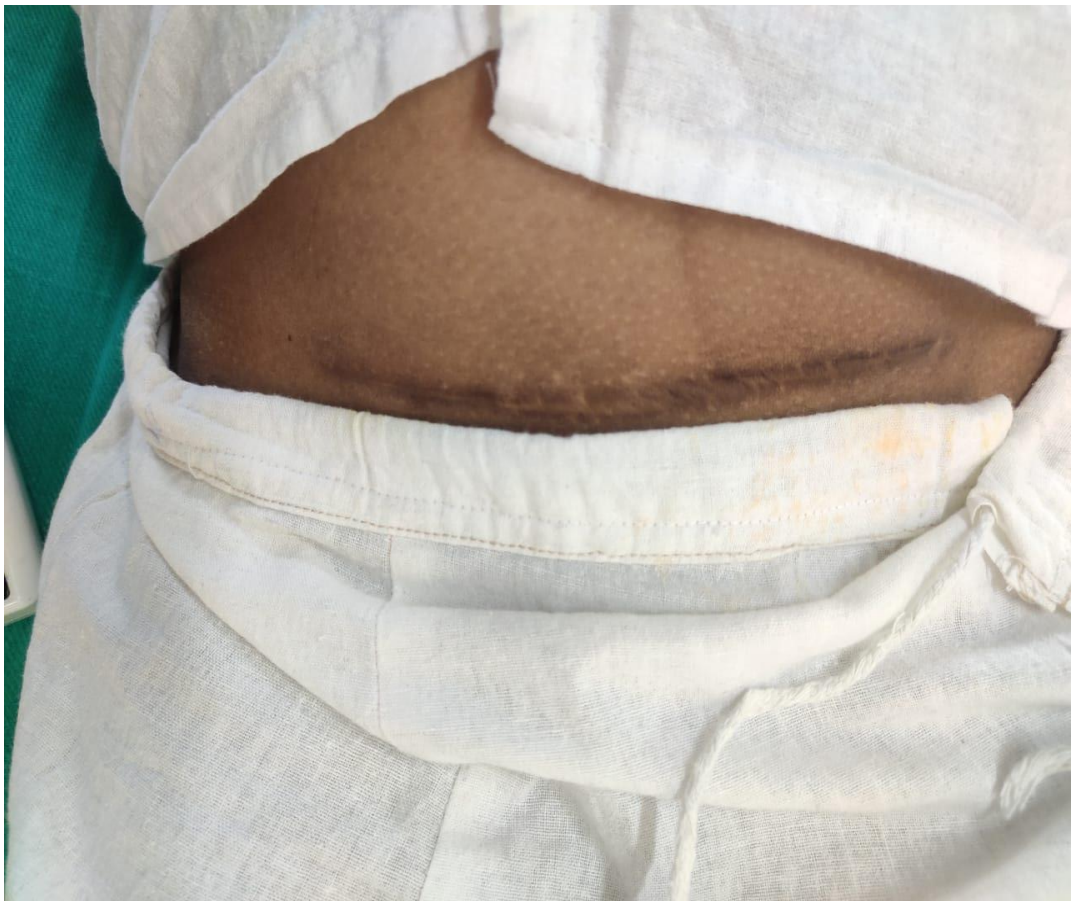


FIG 46: HYPERTROPHIED SCAR

DISCUSSION

The integral part of caesarean section is skin closure. The skin closure plays a very vital role and it also influence postoperative pain, wound healing process, cosmetic outcome of the scar, surgeon and patient satisfaction[23].

The most frequently performed surgery in the world amongst most is Caesarean section[24], more commonly in young women. This surgery may or may not cause morbidity in mother in terms of long-term and short-term consequences. There has been various article discussing about the conflicts of merits and demerits of subcuticular closure but then this method of closure has still been stated to be more advantages than most other closure techniques. The various advantages were reported in terms of wound healing, better cosmetic results and more patient satisfaction rates [25,26].

Absorbable subcuticular continuous suture has shown to reduce the superficial wound dehiscence[27]. As quoted by most of the study the suture closure is the best method for closing the skin in caesarean incision. The choice of subcuticular (absorbable or nonabsorbable) material being more advantageous in terms of wound healing, with better aesthetic result, a good patient satisfaction is also conflicting[6,26].

The aesthetic aspect of the scar was evaluated in this study with help of three characteristics,

1. Hypertrophy,

2. Colour and
3. Width of the scar.

Among them, the most important variable which was given considered was hypertrophy. In 1700 BC the normal formation of scar was detailed by Edwin Smith's papyri[27]. These scars may become elevated, tense, and confined to the margins of the original lesion, called hypertrophic.[28] The various other relevant variable in the consideration of the aesthetic result were the width, presence of transverse marks and coloration[10]. Cross-stitch marks were not included in the evaluation of aesthesis as subcuticular suture doesn't produce it. Contrary to other studies[7,8] this study showed that subcuticular caesarean wound closure with absorbable vicryl showed to have better esthetic results in consideration to hypertrophy, coloration and scar width of Pfannestiel incision in the cesarean section skin closure. Also, it was observed that the subcuticular skin closure with vicryl had showed to be associated with less discomfort[7]. There have been various advantages postulated with absorbable suture of it, the major advantage is it avoids physical and emotional trauma that is involved with suture removal[29]. Removal of non-absorbable suture in postpartum period will be an inconvenience, extra-commitment and also it does not require follow up visit with doctor.

Cesarean incision closure with vicryl suture is associated with a significantly decreased rate of wound complications when compared with prolene. In

summary, we found that for skin closure after delivery, vicryl suture was associated with a 40% reduction in the rate of wound complications when compared with prolene[28,29].

The POSAS offers the advantage of incorporating patient self-assessment of scar-related symptoms and physical characteristics. In a study aimed to test the POSAS on 100 linear scars, when the total scores that patients and observers assigned to scars were compared, it was found that the patients thought worse of their scars than the observers did[33]. Our results are consistent with this earlier finding, and it must also be noted that in our study population, despite objective improvement in the quality of scars over time, the patients' opinions of their scars did not change significantly at the late assessment. This can be attributed in part to itching and pain, which are very uncomfortable for the patient also in the long term, although invisible to the observer, but suggests also that the patient's own view of the scar may be influenced by emotional reactions, changes in body image, and psychosocial factors. An ideal skin closure technique would not only produce appropriate skin approximation and adequate healing but would also be quick, technically simple, and inexpensive and would minimize pain and wound complication and maximize patient's satisfaction. Many studies have shown the superiority of staples for speed closure[34,35,36]. However, speed of placement was not an outcome of interest to this study, because the impact on the operative time may not be so important unless the wound closure time is a significant

proportion of the operation time. Moreover, another potential benefit from using staples instead of sutures is a reduction in the risk of needlestick injury to the surgeon and assistant. Alternatively, absorbable suture, with the lack of requirement for its removal, can improve patient satisfaction. Furthermore, although not within the remit of this study, suture closure can be achieved more economically than stapled closure.

CONCLUSION

Cosmesis an important factor in today's modern era. A cosmetic scar gives patient satisfaction and a mental ease to the operating surgeon.

In our prospective randomized control trial which compared subcuticular skin closure of prolene vs vicryl in elective and emergency cesarean section, our inference was:

1. Wound infection / discharge was less with vicryl
2. Wound cosmesis was better with vicryl.
3. Post operative pain was less with vicryl.
4. Itching and induration was the only disadvantage among vicryl group.
5. Patient and observer satisfaction was high for vicryl group

Hence, we conclude that the vicryl was superior to prolene in subcuticular skin closure for better wound cosmesis, in reducing the post operative pain, wound infection, seroma formation which was statistically significant. Hence this study recommends the use of vicryl for subcuticular closure which can provide a medical service in par with the private hospitals could do. Thus, even the poorest can be benefited by providing treatment and care with less complication, pain and most importantly cosmesis that can satisfy the patient as well the surgeons.

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PROFORMA

Name:

Age:

Occupation:

Address:

Date of admission: Date of Discharge:

Inpatient number: Outpatient number:

History

Marital History:

Menstrual History: L.M.P
E.D.D

Obstetric History:

Past obstetric history:

Past History:

Medical : Diabetes, Hypertension, Renal disease, Cardiac illness, Asthma, Epilepsy, immunological disorder, connective tissue disorder.

Past surgical history:

Family history:

H/O congenital anomalies, H/O twins

H/O Diabetes mellitus, hypertension, tuberculosis, asthma, epilepsy.

Personal history:

General examination:

Weight:

Height:

Weight gain during pregnancy:

BMI:

Systemic examination:

Cardio vascular system:

Respiratory system:

Per abdomen:

Inspection:

Abdomen contour

Scar site

Signs of infection(erythema / induration/ stitch abscess/ exudates / partial dehiscence/ complete dehiscence)

Palpation- induration/ discharge / gapping)

Auscultation:

PSOS

OSAS

அனுமதியுடனான ஒப்புதல் படிவம்

ஆய்வு தலைப்பு: தோலடி அறுவைசிகிச்சை காயம் மூடுதலில் புரோலீன் Vs விக்ரிலின் செயல்திறன், ஒரு சீரற்ற கட்டுப்பாட்டு ஆய்வு

- இந்த ஆய்விற்கான செயல்முறையின் நோக்கத்தை நான் புரிந்துள்ளேன் என்பதை உறுதிப்படுத்துகிறேன். எனக்கு கேள்விகளை கேட்க வாய்ப்பு உள்ளது. என்னுடைய எல்லா கேள்விகளும் சந்தேகங்களும் என் முழு திருப்திக்கு பதில் அளித்துள்ளன.

- ஆய்வில் எனது பங்கேற்பு தன்னார்வமாக இருப்பதையும், என் சட்ட உரிமைகள் பாதிக்கப்படாமல், காரணத்தைத் தெரிவிக்காமல் எப்போது வேண்டுமானாலும் விலக்கிக்கொள்ளலாம் என்பதையும் நான் புரிந்து கொள்கிறேன்.

- ஆய்வில் இருந்து நான் விலகி வந்தாலும் கூட, ஆராய்ச்சிக்கு பொருந்தக்கூடிய என் உடல்நல ஆவணங்களைப் பார்க்க என் நெறிமுறைக் குழு மற்றும் ஒழுங்குமுறை அதிகாரிகளுக்கு எனது அனுமதி தேவையில்லை என்பதை நான் புரிந்து கொள்கிறேன். இந்த அணுகலை நான் ஏற்கிறேன்.

- இருப்பினும், சட்டத்தின் கீழ் தேவைப்பட்டாலன்றி, மூன்றாம் தரப்பினருக்கு வெளியிடப்பட்ட அல்லது வெளியிட்ட எந்த தகவலிலும் என் அடையாளத்தை வெளிப்படுத்த முடியாது என்பதை நான் புரிந்து கொள்கிறேன். இந்த ஆய்விலிருந்து எழும் எந்தவொரு தரவு அல்லது முடிவுகளின் பயன்பாட்டைக் கட்டுப்படுத்துவதை நான் ஏற்றுக்கொள்கிறேன்.

- மேலே உள்ள படிப்பில் கலந்து கொள்ளவும், ஆய்வின் போது கொடுக்கப்பட்ட அறிவுறுத்தல்களுக்கு இணங்கவும், ஆய்வுக் குழுவோடு ஒத்துழைக்கவும், என் உடல்நலம் அல்லது நலம் அல்லது எந்தவொரு எதிர்பாராத அல்லது அசாதாரண அறிகுறிகளிலும் நான் பாதிக்கப்படுகையில் உடனடியாக ஆய்வு ஊழியர்களுக்கு தெரிவிக்கவும், இந்த ஆய்வில் பங்கேற்க ஒப்புக்கொள்கிறேன்.

- நான் இதனுடன் முழுமையான மருத்துவ பரிசோதனை மற்றும் நோயறிதல் சோதனைகள் இரத்தம், உயிர்வேதியியல், கதிரியக்க சோதனைகள் உட்பட சிகிச்சைக்கு உட்படுத்த அனுமதிக்கிறேன்.

ஆய்வு மையம்: எம்.எம்.சி, சென்னை

பங்கேற்பாளரின் பெயர்:

பங்கேற்பாளரின் வயது:

நோயாளி எண்:

நோயாளியின் கையொப்பம்

நோயாளியின் பெயர் மற்றும் முகவரி: ஆராய்ச்சியாளரின் கையொப்பம்:

MASTER CHART – KEY		
ROW HEADINGS	KEY	
SI NO	COMPONENTS	
A	AGE (Yrs)	
B	HEIGHT 9(cms)	
C	WEIGHT	
D	BMI	
E	PARITY	
F	GESTATIONAL AGE (Weeks)	
G	GESTATIONAL AGE (groups)	1 - Pre term 2- Term 3 - Post term
H	TYPES OF CESAREAN	1-emergency 2-elective
I	RESUTURING	Y-YES N- NO
J	OBSTETRIC COMPLICATIONS	0 - NIL
K	OBSERVER EXAMINATION FINDINGS	0-nil 1-erythema 2-induration 3-stitch abscess 4-exudate 5-partial dehiscence 6-complete dehiscence 7-pigmentation
L	PATIENTS COMPLAINTS	0-nil 1- pain 2-itching 3-pliability 4-if hypertrophied 5-vascularisation
M	DATE OF SUTURE REMOVAL	1≤8 2≥9
N	TYPE OF SUTURE MATERIAL USED	1- vicryl 2- prolene
O	OSAS	
P	PSAS	

PLAGIARSM CERTIFICATE

This is to certify that this dissertation work titled "**EFFICACY OF PROLENE vs VICRYL IN SUBCUTICULAR CESAREAN WOUND CLOSURE IN A TERTIARY CARE HOSPITAL – A RANDOMISED CONTROL TRIAL**" of the candidate Dr. . **G. APARNA, REG. NO. 221916853,** for the award of M.S in the branch of **OBSTETRICS AND GYNAECOLOGY**. I personally verified the urkund.com website for the purpose of plagiarism check. I found that the uploaded thesis file contains from introduction to conclusion pages and the result shows FOURTEEN percentage of plagiarism in the dissertation (D123497925)

Signature and Seal of the Guide

PROF DR. N. THAMIZHSELVI, MD., D.G.O.,
PROFESSOR OF OBSTETRICS AND GYNAECOLOGY,
INSTITUTE OF OBSTETRICS AND GYNECOLOGY,
MADRAS MEDICAL COLLEGE,
CHENNAI– 600008

INFORMATION SHEET

TITLE: "EFFICACY OF PROLENE vs VICRYL IN SUBCUTICULAR CESAREAN WOUND CLOSURE IN A TERTIARY CARE HOSPITAL – A RANDOMISED CONTROL TRIAL" A Prospective Study.

Name of the investigator: Dr.G.APARNA

Name of the Participant:

Purpose of Research: To compare the rate of wound healing, complications, pain, and patient satisfaction based on used subcuticular suture material.

Study Design: Prospective study

Study Population: The study would include women undergoing primary cesarean section.

Possible Risks: May have chance of wound infection

Confidentiality of the Information obtained from you: The privacy of the patients in the research will be maintained throughout the study.

In the event of any publication or presentation resulting from the research, no personally identifiable information will be shared.

Can you decide to stop participating in the study?

Taking part in this study is voluntary. You are free to decide whether to participate in this study or to withdraw at anytime.

How will your decision to not participate in the study affect you?

Your decision will not result in any loss of benefits to which you are otherwise entitled.

Signature of Investigator Signature of Participant

Date:

Place:

PATIENT CONSENT FORM

Patient may check **( )** these boxes:

( )I confirm that I have understood the purpose of procedure for the above study. I have the opportunity to ask questions and all my questions and doubts have been answered to my complete satisfaction.

( )I understand that my participation in the study is voluntary and that I am free to withdraw at anytime without giving reason, without my legal rights being affected.

( )I understand that sponsor of the clinical study, others working on the sponsor's behalf, the Ethics committee and the regulatory authorities will not need my permission to look at my health records, both in respect of current study and any further research that maybe conducted in relation to it, even if I withdraw from the study I agree to this access.

( ) However, I understand that my identity will not be revealed in any information released to third parties or published, unless as required under the law. I agree not to restrict the use of any data or results that arise from this study.

Study title: "A Radomised trial of subcuticular closure with prolene vs vicryl in caesarean cases in a tertiary care hospital"- a prospective study

Study Centre: MMC,Chennai

Patient's Name:
Patient's Age:
In Patient Number:

I agree to take part in the above study and to comply with the instructions given during the study and faithfully cooperate with the study team and to immediately in form the study staff if I suffer from any deterioration in my health or well being or any unexpected or unusual symptoms.

I hereby consent to participate in this study.

I hereby give permission to undergo complete clinical examination and diagnostic tests including hematological, biochemical, radiological tests and to undergo treatment.

Signature/Thumb impression of the patient

Patient's Name and Address:

Signature of Investigator

(Dr.G.APARNA)

INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI 600 003

EC Reg.No.ECR/270/Inst./TN/2013/RR-16
Telephone No.044 25305301
Fax: 011 25363970

CERTIFICATE OF APPROVAL

To
Dr.G.APARNA,
Post Graduate – MS (Obstetrics and Gynaecology),
Madras Medical College,
Chennai - 600003.

Dear Dr. G.APARNA,

The Institutional Ethics Committee has considered your request and approved your study titled **"EFFICACY OF PROLENE VS VICRYL IN SUBCUTICULAR CAESEREAN WOUND CLOSURE IN A TERTIARY CARE HOSPITAL – A RADOMISED PARALLEL STUDY "-NO.19102020.** The following members of Ethics Committee were present in the meeting held on **06.10.2020** conducted at Madras Medical College, Chennai 3.

1. Prof.P.V.Jayashankar :Chairperson
2. Prof.N.Gopalakrishnan,MD.,DM., FRCP, Director, Inst.of Nephrology,MMC,Ch : Member Secretary
3. Prof. K.M.Sudha, Prof. Inst. of Pharmacology,MMC,Ch-3 : Member
4. Prof. Alagarsamy Jamila ,MD, Inst. of Patholoy, MMC, Ch-3 : Member
5. Prof.Rema Chandramohan,Prof.of Paediatrics,ICH,Chennai : Member
6. Prof.S.Lakshmi, Prof. of Paediatrics ICH Chennai :Member
7. Tmt.Arnold Saulina, MA.,MSW., :Social Scientist
8. Thiru S.Govindasamy, BA.,BL,High Court,Chennai : Lawyer
9. Thiru K.Ranjith, Ch- 91 : Lay Person

We approve the proposal to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.

Member Secretary – Ethics Committee

MEMBER SECRETARY
INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE
CHENNAI-600 003.

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S NO	A AGE	B HEIGHT	C WEIGHT	D BMI	E PARITY	F CHORIONICITY	G GA WEEKS	H GA GROUPS	I TYPE OF CS	J OBS COMPL	K MEDICAL DISORDER	L STEROID INTAKE	M OBS FINDINGS	N PT COMPLAINTS	OSAS	P PSAS	Q CHANGE OF ANTIBIOTIC NEEDED	R RESUTURING	S SUTURE MATERIAL
1	22	156	56	23.3	1	1	38+2	2	1	1 - GHTN	0	0	0	0	7	14	0	0	1
2	28	160	62	24.12	1	1	39+4	2	1	0	0	0	7	5	8	15	0	0	1
3	32	158	68	28.3	1	1	38+0	2	1	0	1 - BRONCHIAL ASTHMA	0	0	0	6	13	0	0	2
4	30	145	59	27	1	1	40+3	3	1	0	0	0	5	0	30	24	1	1	2
5	28	155	62	26	1	1	39+6	2	1	0	0	0	7	5	8	13	0	0	2
6	18	156	65	27	1	1	38+2	2	1	0	0	0	0	0	5	6	0	0	2
7	30	145	62	29	1	1	38+3	2	1	0	0	0	2	3	22	25	1	0	1
8	20	149	50	22	1	1	39+2	2	1	0	0	0	7	5	15	19	0	0	2
9	26	160	73	29	2	1	39+1	2	1	1 - GHTN, GDM	1 - HYPOTHYROID	0	0	0	6	8	0	0	1
10	24	149	60	27	1	1	38+0	2	1	0	0	0	0	0	5	6	0	0	1
11	24	155	43	18	1	1	38+6	2	1	0	0	0	0	0	7	10	0	0	1
12	36	157	64	30	1	1	38+0	2	2	0	0	0	0	1	9	18	0	0	2
13	29	159	72	29	1	1	37+6	1	1	1- GHTN	0	0	2	5	26	25	1	0	2
14	25	140	57	30	1	1	39+0	2	2	0	1 - HYPOTHYROID	0	0	0	5	6	0	0	1
15	28	162	63	25	1	1	39+4	2	1	0	0	0	0	1	5	12	0	0	1
16	24	152	59	25.5	1	2	37+4	1	2	0	0	0	0	0	7	9	0	0	2
17	32	161	66	25.5	1	1	40+5	3	1	1- GDM	0	0	0	0	8	11	0	0	2
18	22	158	62	24.8	1	1	39+3	2	2	0	0	0	0	0	7	7	0	0	1
19	26	156	68	28	2	1	40+1	3	1	0	0	0	0	1	7	11	0	0	1
20	23	149	66	30	1	1	39+2	2	1	0	1- BRONCHIAL ASTHMA	0	0	1	8	12	0	0	2
21	22	158	53	21.2	1	2	37+6	1	2	0	0	0	1	1	8	19	0	0	2

22	23	155	65	27	1	1	38+3	2	1	0	0	0	0	0	7	14	0	0	2
23	20	159	70	27.7	1	1	39+6	2	1	0	0	0	0	0	5	8	0	0	1
24	29	161	69	26.6	1	1	38+2	2	1	1 - GDM	0	0	4	1	28	26	1	1	1
25	26	163	72	27.1	1	1	39+3	2	1	0	0	0	0	0	7	11	0	0	1
26	32	158	60	24	1	1	40+2	3	1	0	1- SEIZURE DISORDER	0	7	4	10	12	0	0	2
27	33	161	69	26.6	1	1	40+3	3	1	0	0	0	0	0	5	6	0	0	1
28	32	163	75	28.3	1	1	39+3	2	1	0	0	0	0	0	7	10	0	0	2
29	22	140	58	29.6	1	1	38+6	2	1	1- GHTN	0	0	7	5	13	15	0	0	2
30	24	150	68	30	1	1	39+0	2	1	0	0	0	0	0	7	9	0	0	1
31	26	156	74	30	1	1	38+2	2	1	0	0	0	0	0	5	8	0	0	2
32	25	156	60	24.7	2	2	39+4	2	2	0	0	0	0	0	6	8	0	0	2
33	28	142	58	28.8	1	1	38+5	2	1	0	0	0	0	0	5	8	0	0	1
34	23	146	63	29	1	1	39+2	2	1	0	0	0	0	1	6	12	0	0	1
35	24	148	66	30	1	1	38+6	2	1	0	1- BRONCHIAL ASTHMA	0	0	0	7	13	0	0	1
36	29	152	70	30	2	1	38+6	2	1	0	0	0	0	2	8	13	0	0	2
37	28	156	73	30	1	1	38+0	2	1	0	0	0	0	0	5	6	0	0	1
38	29	162	74	28.2	1	1	39+3	2	1	0	0	0	0	0	7	10	0	0	1
39	31	153	70	30	1	1	40+1	3	1	0	0	0	0	0	7	10	0	0	1
40	23	150	68	30	1	1	40+4	3	1	0	0	0	1	0	8	13	0	0	2
41	25	156	72	29.6	1	1	38+3	2	1	0	1 -ANEMIA TREATED	0	0	0	5	9	0	0	1
42	29	160	75	29.3	1	1	39+2	2	1	0	0	0	0	0	7	11	0	0	1
43	32	158	64	25.6	2	2	36+2	1	2	0	0	0	0	0	6	10	0	0	1
44	33	140	59	30	1	1	39+2	2	2	0	0	0	1	1,2	6	12	0	0	2
45	35	156	62	25.5	1	1	39+6	2	2	0	0	0	0	0	5	9	0	0	2
46	36	152	64	27.7	1	1	38+3	2	1	1- SEVERE PRE ECLAMPSIA,	0	0	0	0	6	11	0	0	1

47	22	136	58	29.2	1	1	39+1	2	2	0	0	0	1	0	10	12	0	0	2
48	26	154	69	29	1	2	35+5	1	2	0	0	0	1	1	9	13	0	0	2
49	24	158	66	26.4	1	1	38+5	2	1	0	0	0	2	1	10	15	0	0	1
50	26	153	69	29.5	1	1	39+6	2	1	0	0	0	4	1&2	15	22	1	0	2
51	22	155	70	29	1	1	38+3	2	1	1 -GHTN	0	0	7	1&5	13	21	0	0	2
52	24	156	72	29.6	1	1	40+5	3	1	0	0	0	0	0	7	10	0	0	1
53	21	160	69	27	1	1	40+1	3	1	0	0	0	0	0	5	8	0	0	1
54	29	153	72	29	1	1	39+1	2	1	0	0	0	0	0	6	9	0	0	1
55	30	148	64	29.2	1	1	38+1	2	1	0	1 - HYPOTHYROID	0	1	1&2	14	26	1	0	2
56	33	156	68	27.9	1	1	39+2	2	1	0	0	0	0	0	7	13	0	0	1
57	29	160	72	29	2	1	40+4	3	1	0	0	0	2	2&5	15	27	1	0	1
58	30	152	68	29.4	1	1	38+3	2	1	0	0	0	7	0	9	9	0	0	1
59	31	143	61	29.8	2	1	39+1	2	1	1 - GHTN	0	0	1	1&2	9	13	0	0	2
60	21	150	65	28.9	1	1	40+6	3	1	0	0	0	2	1	10	14	0	0	1
61	24	156	72	29.6	1	1	38+2	2	1	0	0	0	2	0	9	8	0	0	1
62	25	155	65	27	1	1	39+0	2	2	0	0	0	0	0	7	8	0	0	1
63	22	136	48	26	1	1	39+6	2	2	0	1 - PTB	0	2&7	1&2	14	26	1	0	1
64	29	158	66	26.4	1	1	38+2	2	1	0	0	0	0	0	8	11	0	0	1
65	30	148	64	29.2	1	1	37+5	1	1	1 - SEVERE PRE ECLAMPSIA	1 -HYPOTHYROID	0	0	0	7	7	0	0	1
66	21	142	59	29.3	1	1	39+5	2	1	0	0	0	7	1	9	15	0	0	1
67	44	156	72	29.6	1	2	36+2	1	2	1 - SEVERE PRE ECLAMPSIA	0	0	1,2,7	1,2,5	8	19	0	0	2
68	28	136	55	29.7	1	1	39+6	1	2	0	0	0	7	1	9	15	0	0	1
69	26	152	65	28.1	1	1	38+5	1	1	0	0	0	0	0	5	9	0	0	2

70	29	148	66	30	1	1	40+3	3	1	0	1- HYPOTHYROID	0	0	0	6	9	0	0	2
71	24	132	53	30	1	1	39+6	2	2	0	0	0	0	0	7	8	0	0	1
72	26	153	69	29.5	1	1	38+4	2	1	0	0	0	0	0	9	10	0	0	1
73	29	148	67	30.6	1	1	38+0	2	1	0	0	0	0	0	8	13	0	0	2
74	36	140	58	29.6	1	1	39+2	2	2	0	0	0	0	0	5	8	0	0	2
75	49	158	70	28	1	1	38+0	2	2	1- SEVERE PRE ECLAMPSIA,	1 - T2DM on insulin	0	1&4	1,2,4	21	34	1	1	2
76	25	151	69	30	1	1	38+4	2	1	0	0	0	1	1	13	15	0	0	1
77	26	158	74	29.6	1	1	39+1	2	1	1 - GHTN	0	0	1	2	15	18	0	0	2
78	27	159	73	29.2	1	1	38+5	2	1	1 - GDM INSULIN	1- SEIZURE DISORDER, ANEMIA TREATED	0	0	1	9	11	0	0	1
79	22	130	49	29	1	1	37+0	1	2	1 - SEVERE PREECLAMPSIA	0	0	2	1,4	11	23	0	0	2
80	24	154	70	29.5	1	1	39+1	2	1	0	1- HYPOTHYROID	0	0	0	7	9	0	0	1
81	26	155	69	28.7	1	1	38+2	2	1	0	1 - ANEMIA TREATED	0	0	0	8	11	0	0	1
82	29	150	69	30	1	2	38+3	2	2	1-GDM ON INSULIN, GHTN	1 - HYPOTHYROID	0	0	1	9	15	0	0	1
83	30	151	70	30	1	1	39+0	2	1	0	0	0	0	0	7	11	0	0	2
84	31	160	76	29.7	1	1	38+5	2	1	1- GHTN	1- HYPOTHYROID	0	2	1,2	13	17	0	0	2
85	26	147	65	30	1	1	39+6	2	1	1-GHTN	0	0	0	0	7	10	0	0	1

86	24	153	67	28.6	1	1	38+1	2	1	1-GDM ON INSULIN	0	0	1	1	10	15	0	0	1
87	26	140	58	29.6	1	1	39+1	2	1	0	1-HYPOTHYROID	0	2	1	9	13	0	0	2
88	27	146	61	28.6	1	1	38+2	2	1	0	0	0	0	1	7	14	0	0	1
89	24	156	67	27.5	1	1	39+1	2	1	0	0	0	1	1.4	16	21	1	0	2
90	27	154	66	27.8	1	1	38+2	2	1	0	0	0	0	1	8	12	0	0	1
91	22	146	53	24.9	1	1	39+2	2	1	1-GHTN	0	0	0	0	6	9	0	0	1
92	24	149	65	29.3	1	1	38+2	2	1	0	0	0	2	1	11	15	0	0	2
93	32	150	58	25.8	1	2	34+2	1	2	0	1-HYPOTHYROID	0	0	0	9	12	0	0	1
94	33	147	63	29.2	1	1	38+5	2	1	1- GHTN	0	0	1	1	6	11	0	0	2
95	20	156	69	28.4	1	1	37+2	1	1	0	1- ANEMIA TREATED	0	0	0	7	9	0	0	2
96	27	161	72	27.8	2	1	38+3	2	1	0	0	0	0	0	8	10	0	0	1
97	23	154	68	28.7	1	1	39+1	2	1	0		0	7	4	13	15	0	0	2
98	36	154	69	29.1	1	1	38+2	2	1	1- NON SEVERE PREECLAMPSIA	1- HYPOTHYROID	0	1	1	9	15	0	0	1
99	29	148	59	26.9	1	1	37+6	1	1	0	0	0	7	5	10	17	0	0	1
100	25	156	70	28.8	1	1	39+0	2	1	0	0	0	0	1	10	15	0	0	1
101	27	153	65	27.8	1	1	38+4	2	1	1- GHTN	0	0	1	1	9	13	0	0	2
102	26	149	53	23.9	1	1	38+6	2	1	0	1- HYPOTHYROID	0	2	2	10	11	0	0	2

103	27	132	51	29.3	1	1	39+1	2	2	0	1- HYPOTHYROID	0	0	0	7	9	0	0	1
104	29	149	56	25.2	1	1	37+1	1	1	1- NON SEVERE PREECLAMPSIA	1- HYPOTHYROID	0	1	2	11	16	0	0	1
105	23	151	57	25	2	1	38+5	2	1	1- GDM	1- HYPOTHYROID, ANEMIA TREATED	0	1,2	2	15	22	0	0	2
106	32	160	69	27	1	1	38+0	2	1	GHTN, GDM	0	0	0	0	9	16	0	0	1
107	28	150	63	28	1	1	39+1	2	1	0	0	0	0	0	7	15	0	0	1
108	24	154	68	28.7	1	2	38+5	2	1	1-GHTN	1- HYPOTHYROID	0	0	0	7	14	0	0	2
109	22	148	59	26.9	1	1	38+6	2	1	0	0	0	1	2	9	11	0	0	1
110	23	152	64	27.7	1	1	40+3	3	1	0	1- ANEMIA TREATED	0	0	0	6	9	0	0	2
111	26	155	69	28.7	1	1	39+6	2	1	0	0	0	0	1	7	10	0	0	1
112	41	158	70	28	1	2	37+2	1	2	1- GHTN, GDM	0	0	1	2	9	13	0	0	1
113	25	154	66	27.8	1	1	39+1	2	1	0	0	0	2	7	10	15	0	0	1
114	21	147	58	26.8	1	1	38+2	2	2	1- GHTN	1- RESIDUAL POLIO	0	7	4	14	17	0	0	2
115	22	151	57	25	2	1	40+2	3	1	0	0	0	0	0	8	9	0	0	2
116	33	143	56	27.3	3	1	38+1	2	1	1- GESTATIONAL THROMBOCYTOPENNIA	0	0	0	0	6	8	0	0	2
117	22	157	62	25.2	1	1	39+3	2	1	0	1- HYPOTHYRID	0	0	2	6	11	0	0	2

118	23	146	54	25.3	1	1	38+5	2	1	0	1- ANEMIA TREATED	0	4	1,2	16	22	1	0	2
119	25	144	49	23.6	1	1	39+5	2	1	0	0	0	0	2	8	10	0	0	2
120	29	156	59	24.2	1	1	38+3	2	1	0	0		0	0	7	9	0	0	2
121	30	144	56	27	1	1	39+1	2	2	1- RESIDUAL POLIO	0	0	7	4	10	14	0	0	1
122	33	139	56	29	2	1	39+1	2	2	0	0	0	0	4	8	11	0	0	2
123	24	154	62	26.1	1	1	38+6	2	1	0	0	0	0	0	6	9	0	0	1
124	33	158	70	28	1	1	39+3	2	1	0	0	0	1	4	9	12	0	0	1
125	34	156	69	28.4	1	1	38+4	2	1	1-GHTN	0	0	0	0	8	10	0	0	1
126	29	160	71	27.7	1	1	39+5	2	1	1- GHTN	0	0	0	1	8	13	0	0	1
127	27	157	68	27.6	1	1	39+2	2	1	0	1- HYPOTHYRIOD	0	0	0	8	9	0	0	2
128	28	154	59	24.9	1	1	38+5	2	1	0	0	0	0	1	7	10	0	0	2
129	24	155	61	25.4	1	1	39+1	2	1	0	0	0	0	0	5	8	0	0	2
130	26	160	78	30	1	2	36+1	1	2	1- GHTN	1- HYPOTHYROID	0	0	0	7	9	0	0	1
131	28	154	69	29.1	1	1	38+3	2	1	0	0	0	1	0	8	9	0	0	1
132	29	157	71	28.8	1	1	39+1	2	1	1- GESTATIONAL THROMBOCYTOPENIA	0	0	0	1	7	11	0	0	1
133	34	149	58	26.1	1	1	40+4	3	1	0	1- ANEMIA TREATED	0	1,2,4	1,2	18	30	1	0	2
134	33	153	69	29.5	2	1	38+3	2	1	0	0	0	0	0	7	9	0	0	2

135	29	162	74	28.2	1	1	38+6	2	1	0	1- HYPOTHYROID	0	0	0	6	10	0	0	2
136	21	158	66	26.4	1	1	39+5	2	1	0	0	0	1	1	10	16	0	0	1
137	28	149	64	28.8	1	1	39+1	2	1	0	0	0	0	0	8	10	0	0	2
138	24	155	70	29.1	1	1	38+5	2	1	0	0	0	0	1	7	12	0	0	1
139	28	158	69	27.6	1	1	39+2	2	1	0	0	0	0	7	8	11	0	0	2
140	31	156	72	29.6	1	1	38+3	2	1	0	0	0	2	1,7	15	29	0	0	2
141	29	140	60	30	1	1	39+1	2	2	1- GHTN	1 - RESIDUAL POLIO	0	2	1	10	17	0	0	1
142	33	156	70	28.8	1	1	37+0	1	1	1 - SEVERE PREECLAMPSIA	0	0	0	0	8	11	0	0	2
143	25	160	72	28	1	1	40+5	2	1	0	0	0	0	0	9	12	0	0	2
144	22	149	68	30	1	1	39+6	2	1	0	1- HYPOTHYROID, ANEMIA TREATED	0	0	1	11	15	0	0	1
145	28	151	69	30	1	2	38+3	2	2	1- GHTN, GDM	0	0	7	4	17	21	0	0	2
146	25	157	70	28.4	1	1	39+1	2	1	0	1- HYPOTHYROID	0	0	0	9	11	0	0	2
147	26	153	71	30	1	2	38+5	2	2	1 - GHTN	0	0	1	1	8	14	0	0	1
148	24	141	56	28.2	1	1	39+2	2	1	0	1- HYPOTHYROID	0	0	4	10	17	0	0	2
149	25	149	59	26.6	2	1	38+3	2	1	0	0	0	0	0	8	9	0	0	2
150	32	151	68	29.8	1	1	39+1	2	1	0	0	0	0	1	6	16	0	0	2
151	29	155	69	28.7	1	1	38+6	2	1	0	0	0	0	0	7	10	0	0	2
152	28	144	58	28	1	1	39+1	2	1	1 - GHTN	0	0	2	1	9	13	0	0	1

153	20	152	69	29.9	3	1	39+3	2	1	0	1- HYPOTHYROID	0	0	0	7	11	0	0	1
154	31	156	70	28.8	1	1	39+4	2	1	0	0	0	2	0	9	9	0	0	1
155	33	161	71	27.4	1	1	39+4	2	1	1- GDM	0	0	0	0	7	9	0	0	1
156	20	156	69	28.4	1	1	37+3	1	1	0	0	0	0	4	7	10	0	0	2
157	19	157	67	27.5	1	1	38+1	2	1	0	0	0	0	0	8	9	0	0	1
158	21	140	58	29.6	1	2	38+3	2	2	1- GHTN, GDM	1- HYPOTHYROID	0	0	2	6	10	0	0	2
159	31	150	65	28.9	1	1	38+1	2	1	0	0	0	2	4	14	16	1	0	2
160	21	157	71	28.8	1	1	39+1	2	1	0	0	0	0	4	9	10	0	0	2
161	23	148	57	26	1	2	36+3	1	2	1 - GHTN	0	0	0	0	6	8	0	0	1
162	31	133	51	28.8	1	1	38+0	2	2	0	0	0	0	1	7	9	0	0	1
163	46	156	70	28.8	1	1	37+3	1	2	1-GDM	1- HYPOTHYROID	0	0	0	6	9	0	0	1
164	33	145	61	29	1	1	38+3	2	1	0	0	0	2	1	9	13	0	0	1
165	21	151	65	28.5	1	1	37+6	1	1	0	0	0	1	1	13	16	0	0	1
166	22	156	70	28.8	1	1	38+1	2	1	1- GDM	1- ANEMIA TREATED	0	0	0	7	9	0	0	1
167	27	163	74	27.9	1	1	39+1	2	1	0	0	0	2	3	9	14	0	0	2
168	31	159	65	25.7	1	1	39+4	2	1	0	1- HYPOTHYROID	0	0	0	7	10	0	0	1
169	30	152	70	30	1	2	34+1	1	2	0	1- HYPOTHYROID	0	0	1	6	10	0	0	2
170	31	156	71	29.2	1	1	38+3	2	1	0	0	0	0	0	5	10	0	0	1
171	34	156	61	25.1	1	1	39+2	2	1	0	1- ANEMIA TREATED	0	0	2	7	13	0	0	2
172	31	143	51	24.9	1	1	39+5	2	1	1- GHTN	0	0	7	4	14	21	0	0	2

173	18	151	67	29.4	1	1	38+4	2	1	1 - GHTN	0	0	1,2,5	1,2,5	28	36	1	1	2
174	27	154	69	29.1	1	1	40+3	3	1	0	0	0	0	1	9	10	0	0	1
175	23	158	72	28.8	1	1	38+4	2	1	0	1 -SEIZURE DISORDER	0	0	0	7	9	0	0	1
176	26	152	69	29.9	1	1	39+1	2	1	0	0	0	2	0	9	10	0	0	2
177	36	164	73	27.1	1	1	39+6	2	1	0	0	0	0	0	7	10	0	0	2
178	24	154	69	29.1	1	1	39+1	2	1	1- GDM	1 - HYPOTHYROID	0	0	1	8	15	0	0	1
179	26	156	70	28.8	1	1	38+1	2	1	0	0	0	0	0	7	9	0	0	1
180	28	149	53	23.9	1	1	39+6	2	1	0	0	0	0	0	6	10	0	0	2
181	29	156	67	27.5	1	2	36+6	1	2	1- GHTN	1- HYPOTHYROID	0	0	0	7	10	0	0	2
182	31	149	59	26.6	1	1	38+3	2	1	0	0	0	0	2	7	13	0	0	2
183	29	156	71	29.2	1	1	39+2	2	1	0	1- ANEMIA TREATED	0	2	1	10	15	0	0	2
184	31	153	69	29.5	1	1	39+6	2	1	0	1 - HYPOTHYROID	0	0	4	9	17	0	0	2
185	29	155	71	29.6	2	1	38+3	2	1	0	0	0	0	0	7	9	0	0	1
186	18	154	69	29.1	1	1	39+2	2	1	1- GDM	0	0	7	5	17	19	0	0	1
187	21	136	56	30	1	1	39+6	2	1	1 - GDM	1 - HYPOTHYROID	0	0	2	7	11	0	0	2

188	24	148	58	26.5	1	1	38+5	2	1	1 - GESTATIONAL THROMBOCYTOPENIA	0	0	0	0	6	10	0	0	2
189	26	151	68	29.8	1	1	39+1	2	1	0	0	0	0	0	6	9	0	0	1
190	20	153	70	29.9	1	1	39+4	2	1	0	0	0	0	0	8	10	0	0	2
191	31	143	56	27.4	1	2	34+3	1	2	0	0	0	2	1	11	14	0	0	2
192	22	150	64	28.4	1	1	37+5	1	1	0	0	0	7	5	16	21	0	0	2
193	25	152	69	29.9	1	1	38+5	2	1	0	0	0	0	0	6	9	0	0	1
194	26	154	71	29.9	1	1	39+2	2	1	1- GDM	0	0	1	2	10	17	0	0	2
195	28	156	74	30	1	1	40+3	3	1	0	0	0	0	1	8	14	0	0	1
196	22	152	68	29.4	1	1	39+1	2	1	1- GDM	1- HYPOTHYROID , ANEMIA TREATED	0	0	2	7	12	0	0	2
197	24	156	69	28.4	1	1	38+3	2	1	1- GHTN	0	0	0	0	6	10	0	0	2
198	21	153	64	27.3	1	1	39+1	2	1	0	1- HYPOTHYROID	0	0	0	7	11	0	0	1
199	46	160	73	28.5	1	2	36+4	1	2	0	0	0	1	5	8	13	0	0	2
200	31	156	70	28.8	1	1	38+4	2	1	1 - GDM	0	0	0	2	9	14	0	0	2
201	20	153	67	28.6	1	1	39+1	2	1	1- GHTN	0	0	1	2	10	18	0	0	2
202	23	155	71	29.6	2	1	39+3	2	1	0	1 - HYPOTHYROID	0	0	0	8	10	0	0	1
203	24	156	62	25.5	1	1	38+1	2	1	0	1 - SEIZURE DISORDER	0	0	0	7	11	0	0	1
204	44	160	68	26.6	1	1	38+1	2	2	0	1- HYPOTHYROID	0	0	2	8	12	0	0	2
205	34	156	63	25.9	1	1	39+1	2	1	1- GHTN	0	0	0	0	8	9	0	0	1

206	29	165	68	25	1	1	40+4	3	1	0	0	0	0	0	10	11	0	0	2
207	30	156	71	29.2	1	1	39+2	2	1	0	0	0	0	2	7	11	0	0	2
208	28	149	58	26.1	2	1	38+5	2	1	0	0	0	2	1,2	11	15	0	0	1
209	30	149	56	25.2	1	1	39+1	2	1	1-GDM	0	0	1	1	9	13	0	0	1
210	34	144	59	28.5	1	1	38+4	2	1	0	0	0	0	1	8	13	0	0	1
211	29	153	65	27.8	1	1	39+1	2	1	0	0	0	2	2,4	13	21	0	0	2
212	26	156	70	28.8	1	1	38+4	2	1	1- GHTN	1 - HYPOTHYROID	0	0	4	10	19	0	0	2
213	20	161	69	26.6	1	1	38+1	2	1	0	1- ANEMIA TREATED	0	0	0	8	11	0	0	1
214	29	151	66	28.9	1	1	38+3	2	1	0	0	0	1	5	11	13	0	0	2
215	30	157	70	28.4	1	1	38+1	2	1	1 - GHTN	0	0	0	1	7	11	0	0	1
216	24	165	71	26.1	1	1	39+1	2	1	0	0	0	0	2	7	11	0	0	2
217	26	154	59	24.9	1	1	38+4	2	1	0	1- HYPOTHYROID	0	0	0	8	10	0	0	2
218	24	159	72	28.5	1	1	39+6	2	1	0	0	0	1	1,2	1	17	0	0	2
219	24	150	61	27.1	1	1	38+0	2	1	1- GHTN	0	0	0	1	8	12	0	0	1
220	21	143	59	28.9	1	1	38+5	2	1	0	1- PSORIASIS	0	2	1,2	10	19	0	0	2
221	24	145	63	30	1	1	39+4	2	1	0	0	0	1	5	11	13	0	0	2
222	25	151	68	29.8	1	1	40+3	3	1	1 - GDM	0	0	0	0	7	10	0	0	1
223	27	153	69	29.5	1	1	37+6	1	1	1 - GDM	1- HYPOTHYROID	0	0	1	8	13	0	0	1
224	29	160	72	28.1	1	2	38+2	2	2	1- GHTN, GDM	1 - HYPOTHYROID	0	0	2	9	15	0	0	2
225	30	139	59	30.5	1	1	38+3	2	2	0	1- HYPOTHYROID	0	0	0	7	9	0	0	1
226	31	141	61	30	1	1	39+1	2	1	0	1- HYPOTHYROID	0	2	1,2	9	19	0	0	2
227	33	146	59	27.7	1	1	40+4	3	1	0	1- ANEMIA TREATED , HYPOTHYROID, ANEMIA TREATED	0	0	0	7	10	0	0	1
228	19	154	68	28.7	1	1	39+1	2	1	0	0	0	0	2	7	10	0	0	2
229	31	155	62	25.8	1	1	39+1	2	1	0	0	0	0	2	10	13	0	0	2
230	21	160	70	27.3	1	1	39+1	2	1	0	0	0	0	0	7	10	0	0	2
231	34	159	72	28.5	1	1	38+4	2	1	0	0	0	1	1	9	16	0	0	1

232	35	160	75	29.3	1	2	38+6	2	2	1- GHTN	0	0	0	1	7	10	0	0	1
233	34	170	83	28.7	1	1	39+1	2	1	0	1 - SEIZURE DISORDER	0	0	0	7	9	0	0	2
234	29	156	67	27.5	1	1	39+4	2	1	1 - GDM	1 - SCHIZOPRENIA	0	2	1,2	8	17	0	0	1
235	31	162	71	27.1	2	1	40+3	3	1	0	1- HYPOTHYROID	0	0	0	6	8	0	0	1
236	26	156	69	28.4	1	1	38+6	2	1	1 - GHTN	0	0	0	0	10	11	0	0	2
237	27	155	70	29.1	2	1	36+6	1	1	0	0	0	0	0	6	10	0	0	1
238	32	159	71	228.1	1	1	39+2	2	1	0	1- SEIZURE DISORDER	0	0	1	8	16	0	0	1
239	34	165	79	29	1	1	39+2	2	1	1 - GESTATIONAL THROMBOCYTOPENIA	0	0	1	1,2	10	21	0	0	2
240	27	153	66	28.2	2	1	38+6	2	1	0	1 - HYPOTHYROID	0	0	2	6	12	0	0	2
241	22	165	71	26.1	1	1	39+0	2	1	1- GHTN	0	0	2	1	8	11	0	0	1
242	46	168	74	26.2	1	2	36+1	1	2	1- GHTN, GDM	1- HYPOTHYROID	0	0	1	6	18	0	0	1
243	39	169	73	25.6	2	1	38+6	2	1	1- GDM	0	0	0	0	8	10	0	0	1
244	36	154	69	29.1	1	1	37+6	1	1	1 - GDM	0	0	3	1,2	19	31	1	1	2
245	29	166	76	27.6	1	1	39+3	2	1	0	0	0	0	0	6	7	0	0	1
246	31	156	61	25.1	1	1	38+4	2	1	0	1 - SEIZURE DISORDER, BRONCHIAL ASTHMA	0	0	0	9	10	0	0	1
247	33	155	62	25.8	1	1	39+22	2	1	0	1- HYPOTHYROID	0	0	2	8	11	0	0	2
248	30	154	69	29.1	1	1	39+1	2	1	0	1- BRONHIAL ASTHMA	0	5	1,2,5	26	38	1	1	1
249	19	150	63	28	1	1	38+5	2	1	1- GHTN	0	0	0	2	6	12	0	0	2
250	21	155	71	29.6	1	1	39+1	2	1	0	0	0	0	0	6	9	0	0	1
251	24	155	65	27.1	1	1	38+3	2	1	0	0	0	0	1	8	13	0	0	1

252	25	139	51	26.4	1	1	39+2	2	2	0	0	0	1	1	10	13	0	0	2
253	26	151	61	24.1	1	1	38+4	2	1	0	0	0	0	2	7	13	0	0	2
254	33	156	68	27.9	1	1	39+2	2	1	0	1 - BRONCHIAL ASTHMA	0	0	1,2	11	19	0	0	2
255	26	160	69	27	1	1	38+3	2	1	1- GHTN	0	0	1	1	9	13	0	0	1
256	29	161	74	28.5	1	1	39+2	2	1	1- GHTN	1 - HYPOTHYROID	0	0	0	7	9	0	0	1
257	31	156	69	28.4	2	1	38+3	2	1	0	1- BRONCHIAL ASTHMA, ANEMIA TREATED	0	0	2	6	12	0	0	2
258	29	145	58	27.6	1	1	38+4	2	1	0	1 -HYPOTHYROID	0	1	1,2	14	21	1	0	2
259	31	151	67	29.4	1	1	39+1	2	1	0	1- HYPOTHYROID	0	1	2	10	15	0	0	2
260	32	154	69	29.1	1	1	38+3	2	1	1- GHTN	1- HYPOTHYROID	0	0	0	7	10	0	0	1
261	29	156	70	28.8	1	1	38+6	2	1	1- GHTN, GDM	0	0	0	2	8	13	0	0	2
262	32	160	72	28.1	2	1	39+1	2	1	1- GHTN	0	0	0	0	6	9	0	0	1
263	36	156	74	30	1	1	39+1	2	1	0	1- BRONCHIAL ASTHMA	0	0	1	7	11	0	0	1
264	21	153	68	29	1	1	38+1	2	1	1- GHTN	1- SEIZURE DISORDER	0	0	2	7	18	0	0	2
265	23	156	72	29.6	1	1	38+2	2	1	1- GDM	1- HYPOTHYROID	0	0	1	6	10	0	0	1
266	26	161	69	26.6	2	1	39+1	2	1	1- GHTN	0	0	1	1,2	10	19	0	0	2
267	27	166	75	27.2	1	1	34+6	1	2	1-GHTN	0	0	0	2	13	19	0	0	2
268	24	154	69	29.1	1	1	39+3	2	1	0	0	0	0	0	6	9	0	0	1

269	27	160	74	27.5	1	1	38+3	2	1	0	1-BRONCHIAL ASTHMA	0	0	2	8	11	0	0	1
270	31	156	68	27.9	1	2	38+3	2	2	1-GHTN	1-HYPOTHYROID	0	0	0	6	10	0	0	2
271	33	144	60	28.9	1	2	36+1	1	2	1- GHTN	1- HYPOTHYROID	0	1	1,2	14	25	0	0	2
272	36	142	60	29.8	1	1	39+5	2	1	1 - GDM	1 - BRONCHIAL ASTHMA	0	0	0	6	9	0	0	1
273	28	154	70	29.5	1	1	38+1	2	1	0	1 - SEIZURE DISORDER, HYPOTHYROID	0	0	1	7	10	0	0	1
274	22	156	68	27.9	1	1	38+6	2	1	1 -GHTN	0	0	0	0	6	9	0	0	1
275	26	157	70	28.4	1	1	38+2	2	1	0	0	0	0	0	6	8	0	0	2
276	31	160	74	28.9	1	1	39+5	2	1	1 - GDM	1 - HYPOTHYROID	0	0	2	7	13	0	0	2
277	36	170	74	25.6	1	1	40+4	3	1	0	1 - HYPOTHYROID	0	7	4	17	21	0	0	2
278	30	139	58	30	1	1	39+6	2	2	0	0	0	0	0	6	8	0	0	2
279	19	156	65	26.7	1	1	38+4	2	1	0	0	0	0	0	9	10	0	0	2
280	21	161	75	28.9	1	1	37+2	1	1	1- IMMINENT ECALMPSIA	0	0	2	1,2	10	19	0	0	2
281	31	146	61	28.6	1	1	38+3	2	1	0	0	0	0	0	8	11	0	0	1
282	26	147	64	29.6	1	1	38+6	2	1	1 - GDM	1 - HYPOTHYROID	0	0	4	13	17	0	0	2
283	27	154	60	25.3	1	1	39+3	2	1	0	0	0	0	0	6	9	0	0	1
284	26	154	61	25.7	1	1	38+6	2	1	0	0	0	0	0	8	9	0	0	1
285	21	149	56	25.2	1	1	38+6	2	1	0	0	0	0	2	7	11	0	0	2
286	26	153	61	26.1	1	1	38+1	2	1	01 - GHTN	1 - ANEMIA TREATED	0	1	1,2	9	15	0	0	2
287	28	156	74	30	2	1	36+3	1	2	1 - GHTN	0	0	0	0	6	10	0	0	1
288	20	153	59	25.2	1	1	37+6	1	1	0	0	0	0	0	6	9	0	0	2
289	44	160	77	30	1	1	37+0	1	1	1 - SEVERE PRE ECLAMPSIA	1 - HYPOTHYROID	0	1,2	1,2	18	21	0	0	2
290	30	155	68	28.3	1	1	35+4	1	1	1 - AP ECCLAPMSIA	0	0	0	0	7	9	0	0	1
291	31	156	63	25.9	1	1	38+1	2	1	0	0	0	0	0	6	9	0	0	2

292	28	154	67	28.3	1	1	38+0	2	1	1 - GHTN	0	0	0	0	6	10	0	0	1
293	23	153	69	29.5	1	1	39+1	2	1	1 - GDM	1 - HYPOTHYROID	0	0	2	7	10	0	0	2
294	24	156	73	30	2	1	39+3	2	1	1 - GHTN	0	0	1	1	9	13	0	0	1
295	26	140	61	29.6	1	1	38+4	2	2	0	1 - RESIDUAL POLIO	0	1	1	10	16	0	0	1
296	25	150	68	30	1	1	39+0	2	1	0	0	0	0	0	7	10	0	0	1
297	27	154	71	29.9	1	1	38+5	2	1	0	0	0	0	0	7	8	0	0	2
298	37	160	76	29.7	2	1	40+1	3	1	0	0	0	0	0	9	11	0	0	1
299	21	153	67	28.6	1	1	36+4	1	1	0	0	0	1	0	9	13	0	0	2
300	21	156	63	25.9	1	1	38+6	1	1	0	0	0	1	0	8	10	0	0	2