A STUDY ON MANAGEMENT OF CARCINOMA PENIS

Dissertation submitted in partial fulfillment of regulation for the award of

M.S. Degree in General Surgery

(Branch I)

THE TAMILNADU
DR. M.G.R. MEDICAL UNIVERSITY

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COIMBATORE MEDICAL COLLEGE
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CERTIFICATE

Certified that this is the bonafide dissertation done by **Dr.A.JOSEPH STALIN A.MUTHU** and submitted in partial fulfillment of the requirements for the Degree of M.S., General Surgery, Branch I of The Tamilnadu Dr. M.G.R. Medical University, Chennai.

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DECLARATION

I solemnly declare that the dissertation titled **"A STUDY ON MANAGEMENT OF CARCINOMA PENIS"** was done by me from 2007 onwards under the guidance and supervision of

Professor Dr. A. Ramamoorthy M.S.

This dissertation is submitted to the Tamilnadu Dr. MGR Medical University towards the partial fulfillment of the requirement for the award of MS Degree in General Surgery (Branch I).

Place :

Dr. A.JOSEPH STALIN

Date :

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CONTENTS

HISTORY

HISTORY

- Sushrutha around 600 B.C. identified and described incurable penile growths namely Raktja Arubas and Granthis and suggested amputation.
- Mac Cormac in 1886 described 5 cases treated by radical penectomy and bilateral block dissection of regional 1ymph nodes.
- 1912, Gibson described in detail how to perform Total penectomy
- Young in 1935 described partial penectomy with Inguinal lymphadenectomy and it remains the standard of cure.
- Classical lymphadenectomy was described by Dasler in 1948.
- Modified Inguinal lymphadenectomy was introduced by Catalona.
- LASER Theraphy without functional impairment was used by Hofstetter and Frank in 1976.
- Organ sparing surgery was made possible using Mohs micrographic surgery.

ANATOMY

ANATOMY

EMBRYOLOGY

Penis has two separate origins for its three erectile bodies. When the paired genital tubercles meet in midline, they are responsible for the formation of the paired corpora cavernosa and their crura which are attached to bony pelvis. The development of the caudal end of the urogenital sinus and the paired urethral folds are responsible for the development of the bulbous and penile urethra with the surrounding spongy tissue which expands distally to form the glans penis.

GROSS ANATOMY

Penis is divided into 3 parts. The root, the body and the glans. The root lies in the superficial perineal pouch and provides fixation and stability. The body which constitutes the major part is composed of erectile tissues completely covered by skin. The glans is the distal expansion of the corpus spongiosum; it is conical and normally covered by loose skin of prepuce.

The two cavernous bodies lie on the dorsum of the penis, and are surrounded by a double layer of dense fibrous connective tissue named Buck's fascia. They are incompletely separated by a layer of same tissue, the septum penis, through the major part of the penile body; approaching the perineum, the corpora diverge from each other to form the crura. Each crus penis diverges from its fellow, undergoes some enlargement, and gains attachment to the public arch all the way down to the tuberosity of the Ischia. Each crus is firmly adherent to the ramus of the ischium and pubis and is surrounded by the fibres of the ischiocavernous muscles.

The corpus spongiousum of the penis is an erectile mass similar to that of the corpus cavernosum, but of finar construction. It surrounds the urethra, is central in anterior position and lies in the ventral aspect of the penis. The anterior end of corpus spongiosum is expanded and forms the glans penis which fits closely over the blunt rounded ends of the corpora cavernosa.

The urethra opens by a vertical slits at the end of the glans. The elongated masses of erectile tissue constituting the body of penis are capable of considerable enlargement when they are engorged with blood during erection.

The skin covering the penis is remarkable for its thinness and looseness of connection with the fascial sheath of the organ. The skin of the penis is folded upon itself to form the prepuce, which overlaps the glans for a considerable distance.

The internal layer of the prepuce is confluent with the skin that covers and adheres firmly to the glans and is continuous with the mucous membrane of the urethra at the external meatus. The prepuce is separated from the glans by potential space- the preputial sac. The penis is supported and suspended by two ligaments. T he fundiform ligament is continuous with the lower end of linea alba; then it splits into lamina that surrounds the body of the penis ant units underneath it and fuses with the septa of the scrotum.

The suspensory ligament which is deep to fundiform ligament is triangular and attached above to the front of the pubic symphisis and below it blends with the fascia of the penis on each side of the organ.

BLOOD SUPPLY - ARTERIES

It is a highly vascular organ. Most of its blood supply is from the internal pudendal artery, a branch of the internal iliac artery. This provides 3 main branches, the deep artery of the penis, the bulbal artery and the urethral artery. The deep artery of the penis runs through the entire corpus cavernosum.

The urethral artery supplies the bulbous urethra as well as the bulbous spongiosus. There is also deep dorsal artery of the penis which runs below the transverse pubic ligament, to proceed forward to dorsum of penis between the layers of the suspensory ligament. It lies between the two dorsal veins and the dorsal nerves of the penis, below the Buck’s fascia. This artery continues to supply the glans penis.

VENOUS DRAINAGE

It is mainly through 3 main channels. The cavernous veins, the deep and superficial dorsal veins. The cavernous vein is responcible for venous drainage from the corpus carvernosum. The circumflex veins join the deep dorsal vein of the penis, which the superficial dorsal veins lying outside Back's fascia drain prepuce and the skin of the penis and empty into the prostatic plexus.

NERVE SUPPLY

It is primarily from pelvic plexus; parasympathetic component from S2-S4, sympathetic from hypogastric plexus. A portion of the pelvic plexus is known as the prostatic. From these prostatic plexus cavernous nerves arise which supply the corpus cavernosum and are responsible for erection.

ETIOLOGY

ETIOLOGY

The incidences of Carcinoma of penis varies markedly with the hygienic standards and the cultural and religious practices of different countries. Circumcision has been well established as a prophylactic measure that virtually eliminates the occurrence of penile carcinoma. The development of the tumour in uncircumcised men has been attributed to the chronic irrigative effects of smegma, a by – product of bacterial action on desquamated epithelial cells that are within the preputial sac. Such exposure is accentuated by phimosis, which is found in 25% to 75% of patients reported in large series.

Although definitive evidence that smegma is a carcinogen has not been established (Reddy and Baruah, 1963) its relationship to the development of the penile carcinoma has been widely observed.

Carcinoma of penis is so rare amoung the Jewish where neonatal circumcision is a universal practice. In India, carcinoma of penis is extremely rare amoung the neonatal circumcision Jewish population but somewhat more comman amoung Muslims who practice prepubertal circumcision. It is quite common among the uncircumcised Christian and Hindu population (Paymaster and Gangadharan, 1967).

The tumour is rare among the neonatally circumcised individuals but more frequent when it is delayed until puberty. Adult circumcision appears to offer little or no protection from subsequent

Development of the disease. This suggests that some period of exposure to smegma may account for the decrease in effectiveness of prepubertal circumcision and negligible protective effect of adult circumcision.

Although a history of trauma may predate the development of carcinoma of penis, it is thought this finding is coincidental rather that causal.

No consistent etiologic relationship of penile cancer to venereal disease-syphilis, granuloma inguinale, and chanchroid has been found, and association of the disease with penile cancer is probably coincidental. Penile cancer has also been associated with sexually transmitted HPV

PREMALIGNANT PENILE LESIONS:

Following are considered as premalignant lesions.

1. Condyloma accuminata.
2. Pseudo-epitheliomatous hyperplasia.
3. Erythroplasia of Queyrat.
4. Leucoplakia.
5. Penile horns.
6. Balanitis xerotica obliterans.
7. Paget's disease.
8. Buschke-Lowenstein disease, Giant Condylomata.
9. Papulo-Squamous lesions.

MODES OF PRESENTATION

MODES OF PRESENTATION

SIGNS

The presentation ranges from relatively subtle indurations or small excrescence to a small papule, pustule, warty growth, or more luxuriant exophytic lesion. It may appear as a shallow erosion or deep excavated ulcer with elevated or rolled edges. Phimosis may obscure a lesion and allow for a tumor to progress silently.

Eventually, erosion through the prepuce, foul preputial odour, and discharge with or without bleeding call attention to the disease. Penile tumours may present anywhere on the penis but occur most commonly on the glans (48%) and prepuce (21%). Other tumors involve glans and prepuce (9%), Coronal sulcus (6%) and shaft (<2%).

Rarely a mass, ulceration, suppuration, or hemorrhage may present in the inguinal area because of the presence of nodal metastases from a lesion concealed within phimotic foreskin. Urinary retention or urethral fistulas owing to local corporeal involvement are rare presenting signs.

SYMPTOMS

Pain does not develop in proportion to the extent of the local destructive process and usually is not a presenting complaint. Weakness, weight loss, fatigue and systemic malaise can occur secondary to chronic suppuration. Occasionally, significant blood loss from the penile lesion, the nodal lesion, or both may occur.

DIAGNOSIS

DIAGNOSIS

Patients with cancer of the penis, more than patients with other types of cancer, seem of delay seeking medical attention.15% of patients have been noted to delay medical care for more than a year. Delayed diagnosis will decrease the survival. Earlier diagnosis and time bound treatment will improve the outcome.

At presentation the majority of lesions are confined to the penis. The penile lesion is assessed with regard to size, location, fixation and involvement of the corporeal bodies. Inspection of the base of the penis and scrotum is necessary to rule out extension into these areas. Rectal and bimanual examination provides information about perineal body involvement and the presences of a pelvic mass. Careful bilateral palpation of the inguinal area for adenopathy is of extreme importance.

STAGING

STAGING

Current methods of clinical staging are as under:

1. HANSON'S STAGE

Stage I: A superficial growth confined to glans or Prepuce.

Stage II: Extension to shaft; palpable but mobile Regional 1ymph nodes.

Stage III: Tumor confined to penis; lymph nodes fixed.

Stage IV: Tumor encroaching on to perineum or Scrotum; nodes fixed or distant metastasis.

2. MODIFIED JACKSON

Stage I: Confined to glans or Prepuce.

Stage II: Disease extension to shaft (involving Corpora cavernosa). No palpable regional lymph nodes.

Stage III: Inguinal nodes palpable and mobile.

Stage IV: Primary tumor encroaching on to perineum or Scrotum, etc or /and nodes fixed or distant metastasis.

3. UICC, TNM CLASSIFICATION

A. Primary Tumor(T)

Tx	Primary tumor cannot be assessed.
T0	No evidence of Primary tumor.
Tis	Carcinoma in situ.
Ta	Noninvasive verrucous carcinoma.
T1	Tumor invades subepithelial connective tissue.
T2	Tumor invades corpus spongiosum or cavernosum.
T3	Tumor invades urethra or prostate.
T4	Tumor invades other adjacent structures.

B. Regional Lymph Nodes (N)

Nx	regional lymph nodes cannot be assessed.
N0	No regional lymph nodes metastasis.
N1	Metastasis in a single, superficial lymph nodes.
N2	Metastasis in multiple or bilateral superficial inguinal lymph nodes.
N3	Metastasis in deep inguinal or pelvic 1ymphnodes(s), unilateral or bilateral

C. Distance Metastasis (M)

Mx	Presence of distant metastasis cannot be assessed.
M0	No distant metastasis.
M1	Distant metastasis.

BIOPSY

Confirmation of the diagnosis of carcinoma of the penis and assessment of the depth of invasion of the lesion by microscopic examination of a biopsy specimen are mandatory before the initiation of therapy.No harmful effects related to tumour dissemination from biopsy of the penis have been reported. An alternative approach is biopsy with frozen section confirmation followed by partial or total penectomy. Full informed consent must be obtained before the procedure.

Propreative procedure in growth of the penis as circumcision, FNAC, and wedge biopsy and for inguinal nodes as FNAC and excision will be done to confirm the diagnosis. Post operatve excision biopsy of the growth and node will be done to rule out positive margin.

HISTOLOGY

The majority of tumour of the penis squamous cell carcinomas demonstrating keratinisation, epithelial pearl formation, and various degrees of mitotic activity. The normal rate pegs are disrupted; invasive lesions penetrate the basement membrane and surrounding structures.

GRADING

Most malignancies of the penis are of low grade, reduced survival among patients with anaplastic tumour. Loss of cell surface blood group antigens has been associated with invasion and metastasis. DNA ploidy determination using archival pathology material has been related to prognosis in a number of urogenital and non-urologic tumours.Aneuploidy may predict disease of greater biologic potential for growth and metastasis. The stroungest prognostic indicator for survival continues to be absence of nodal metastasis.

LABORATORY STUDIES

Laboratory studies in patients with penile cancer are usually normal. Anemia leukocytosis and hypo-albuminemia may be present in patients with chronic illness, malnutrition, and extensive suppuration at the area of the primary and inguinal metastatic sites. Azotemia may develop secondary to urethral or urethral obstruction.

Hypercalcemia without detectable osseous matastasis has been associated with penile cancer. It is often associated with inguinal metastasis and may resolve following excision of involved inguinal nodes. Para hormonal substances may be produced by both tumour and metastasis. Medical treatment of hypercalcemia includes saline hydration and administration of diuretics, steroitics, calcitonin and mithramycin.

RADIOLOGICAL STUDIES

Intravenous urography is generally not indicated unless massive retroperitoneal nodes are present. Although lymphangiography can opacify the three major nodes groups-external iliac,common iliac and obturator nodes the hypogastric and presacral nodes are generally not seen. The technical difficulty of the procedure, combined with increased availability of computed tomography scanning and magnetic resonance imaging has made lymphangiography now largely obsolete in this disease.Fine needle biopsy used in lymph node prescribed before prophylactic radiotherapy. Sentinel node biopsy in inguinal nodal involvement is done where there is no clinical involvement found.

Staging laparotomy which is suggested but not carried due to increased morbidity and mortality.

Miscellaneous; Bone scan, X-Ray chest is done where suspicious of secondary deposits arise.

MINIMAL DIAGNOSTIC CRITERIA FOR CARCINOMA OF PENIS:

Primary tumour

Clinical examination

Incisional – excisional biopsy of lesion and histological examination for grade and depth of invasion

Regional and juxtaregional lymph nodes (N)

Clinical examination

CT scan

Superficial inguinal node dissection for high grade or invasive histology

Lymphangiography and aspiration cytology (optional)

Distant Metastasis

Clinical examination

Chest radiograph, CT scan

MRI, Bone scan (optional)

Biochemical determinations (liver functions, calcium)

DIFFERENTIAL DIAGNOSIS

DIFFERENTIALDIAGNOSIS

A number of penile lesions must be considered in the differential diagnosis of penile carcinoma. They include condyloma accuminata, Bushke-Lowenstein tumour as well as number of inflammatory lesions – chancre, chancroid, herpes, 1ymphogranuloma venereum, granuloma inguinale and tuberculosis. These diseases can be identified by appropriate skin tests, tissue studies, serological examinations, cultures or specialized staining techniques.

TREATMENT

TREATMENT OF PRIMARY NEOPLASM

The gold standard of therapy for cancer penis is partial or total penectomy. The low incidence of distant metastasis, the significant morbidity that can result from untreated local disease, and the success of long term palliation and survival even with advanced disease support aggressive local therapy whenever possible.

CONVENTIONAL SURGICAL TREATMENT

For lesions involving the glans and distal shaft, even when apparently superficial, partial amputation with a 2 cm margin proximal to the turmour is necessary to minimize local recurrence. Frozen section of the proximal margin is recommended for confirmation of a tumour-free margin of resection. No local recurrences following total penectomy and a 6% local recurrence rate after partial penectomy. Local wedge resection has been associated with recurrences of up to 50%. Adequate partial penectomy in the absence of inguinal nodes can provide 5 years survival rates of 70% to 80%.

LOCAL SURGERY FOR TUMOUR

1. MOHS MICROGRAPHIC SURGERY:

MMS is a method of removing skin cancer by excising tissue in thin layers. First introduced in 1941 by Mohs was described as microscopically controlled chemosurgery. The capability of MMS to trace out silent tumours "extensions" with a cure rate equivalent to the more radical surgical techniques, while allowing the maximum preservation of normal, uninvolved tissue, makes it an attractive modality for the treatment of some carcinoma of the penis.

After MMS, the areas of excision are allowed to heal well by secondary intention, and meatal stenosis can be a complication. Meatal stenosis is treated by standard techniques with island flaps to reconstruct the meatus or a Y-V advancement technique to relieve the stenosis. The appearance of the distal shaft of the penis can be improved by recreating a coronal margin.

For small lesions and in selected patients, however, MMS appears to provide cure rates at least equal to those associated with partial

penectomy, while leaving the patient with less long term functional and cosmetic disability.

2. LOCAL EXCISION

As the recurrence rate is high, it is better to restrict local excision to tiny, warty lesions and where the diagnosis is in doubt or where the primary lesion is inconspicuous.

3. CIRCUMCISION

Circumcision is possible only when a lesion is confined to the prepuce, and encouraging results have been reported. After retraction of the prepuce, with a slit if necessary, the lesion is found to be superficial and is at least 2 to 2.5 cm from the corona glandis. The are to be excised is carefully marked out before making incisions.

4. RADIOTHERAPY

Primary radiation therapy allows for preservation of penile structure and function in carefully selected patients.

Radiation therapy may be considered in a select group of patients:

1. Young individuals presenting with small (2-3 cm), superficial, exophytic, non-invasive lesions on the glans or coronal sulcus.
2. patients refusing surgery as an initial form treatment and

3. Patients with inoperable tumour or distant metastasis who require local therepy to the primary tumour but who express a desire to retain the penis.

Radiation therapy usually administered over a period of 3 to 6 weeks.

Disadvantages to radiation therapy will be development of urethral fistula, stricuture stenosis with or without penile necrosis, pain and edema. The Squamous cell carcinoma is characteristically radio resistant. Infection is frequently associated with newly diagnosed penile cancer, and this markedly reduces the therapeutic effects of radiation.

The success of radiation therapy depends on treatment schedules. Total radiation dosages, and modality-external beam, electron been radium mold and interstitial therapy. Small, superficial tumors respond well to radiotherapy and with careful planning, complications can be minimized.

5. LASER SURGERY

Laser therapy has been employed to treat many benign and premalignant penile lesions as well as stage Tis, Ta, T1, and some T2 penile cancer. The aim is destruction of the lesion with preservation of normal structure and function.

Currently, four different types of laser are used in the treatment of penile lesions; CO2, Nd: YAG, argon, and potassium titany1 phosphate (KTP).

The CO2 laser has a wavelength of 10,600 nm. The beam energy is absorbed by intracellular water, which is then heated to a high temperature. This results in vaporization of the tissue being treated. The thus produces a 'scalpel' effect limited to the surface of the tissue under treatment. This laser can coagulate only small blood vessels (0.5 mm), so it is not effective in producing hemostasis.

The Nd: YAG laser has a wavelength of 1060 nm end produces tissue penetration, depending on the power used, of 3 to 6 mm, making it ideal for treating superficial skin lesions. It can coagulate vessels up to 5 mm in diameter effectively. There is a 20% to 30% 'forward scatter' of energy, which may inadvertently produce tissue changes beyond the immediate field of treatment.

Both the argon and XTP lasers have similar wavelengths (488-515 nm for argon and 532 nm for XTP), which are maximally absorbed in tissue pigments such as hemoglobin and melanin. Both beams have less tissue-penetrating ability than the CO2 laser.

6. OTHER LOCAL THERAPY

5-FU cream, electro fulguration is useful in premalignant and in-situ lesions.

PARTIAL AMPUTATION

A flag method is commonly employed. A fine catheter or a piece of soft rubber tubing or a non crushing intestinal clamp is applied around the base of penis as tourniquet. The combined lengths of two flaps, the cut edges of which must be at least 2.5 cm clear of the growth, should be a little more than the diameter of the penis. The inferior flap should be longer than the superior one so that the suture line is at a higher level than the urethra which is brought out through a stab incision subcutaneous tissue. Down to Buck's fascia which covers the corpora cavernosa and the corpus spongiosum and reflecting them back to their bases. The corpora cavernosa are divided at this level but the corpus spongiosum and the urethra are divided some 1.5 to 2 cm more distally. The tourniquet is now removed and all bleeding vessels secured. The stump of the urethra is brought through a suitably placed stab wound in the inferior flap. The end of the emerging urethra is split into two halves by short laterl incisions and each half is sutured beyond the margin of the stab wound so that the urethra protrudes slightly beyond the skin.

TOTAL AMPUTATION OF PENIS

The patient is placed in the lithotomy – Trendelenberg position and the penis is enclosed in a polythene or rubber glove to allow cleaning of the whole area. A racquet incision is made encircling the base of the penis and is carried backwards in the midline of the scrotum and perineum to a point some 2-3 cm in front of the anus. Alternatively, an inverted U scrotal flap is used extending the incision forwards to encircle the base of the penis.

By dissection exactly in the midline towards a bougie which has been placed in the urethra, the scrotum is split into two halves which are retracted laterally. The penis is then mobilized anteriorly by dividing the suspensory ligament and ligating the dorsal vessels. The penis is further separated from the public arch, and the deep vessels (especially the deep dorsal vein of the penis) ligated. The perineal part of the incision is deepened to expose the bulb of the penis. (Covered by the bulbospongiosus muscle) and the crura (each covered by ischiocavernous muscle). The bulb is separated from the anterior part of the perineal membrane, and the crura are detached from the margins of public arch and divided, leaving a thin rim of tissue which is secured with sutures to control bleeding. The bougie is now removed; the urethra is dissected out of the muscular fibers surrounding the bulb and is divided about 5 cm below the perineal membrane.

The anterior part of the wound is repaired by suturing the skin flaps together in the midline; the posterior part is sutured around the stump of the urethra so that this now pursues a direct course from the bladder neck to the perineum and protrudes some 5 cm beyond the skin. The protruding part of the urethral stump is split into two halves by making short anterior and posterior incisions; these are then separated and loosely sutured to overlap the surrounding skin edges. The catheter is left in the bladder for some days. Ther perineal urethral meatus functions well and seldom becomes stenosed. In the operation described, the scrotum and testis are retained. Many patients find that the perineal urethrostomy is difficult to manage so long as the scrotum remains, because it tends to get in the way of the urinary stream and becomes wet and excoriated. It may be preferable, therefore, to remove the scrotum and testis as part of the procedure.

RECONSTRUCTIVE SURGERY OF PENIS

PHALLUS LENGIHENING

Fair amount of additional length can be obtained by simple web plasty at the penoscrotal junction. Further length is obtained by dividing the infundibular ligament and the suspensory ligament. If the length is still insufficient, the corpora cavernosa is freed from the public attachment and reefed together using cotton thread. Additional skin is provided by lateral scrotal flaps. The urethra is left 1 cm longer, quilled and flaps stitched in a manner as to achieve an appearance resembling the normal phallus.

TOTAL PENILE RECONSTRUCTION

The aim is to provide urinary function and the feeling of having a phallus initially, all procedures for phallic construction involved delayed formation and transfer of tubed abdominal flaps. These tubes were produced from random flaps of skin and because of their size were based on a tenuous blood supply. To allow new vascular patterns to become established in the transferred tissue, they were formed in stages, with a

delay between the stages. In the tube-within in-a-tube design, the inner tube allowed for placement of a baculum during intercourse and the inner tube provided skin coverage. Patients voided through a proximal urethrostomy. Orticochea described total reconstruction of the penis using the gracilis musculocutaneous flap; in 1978, Puckett and montie reported a series in which they constructed the penis using a tubed groin flap. Today, forearm flaps are the most commonly employed method for total phallic construction and penile reconstruction. The forearm flap is a fasciocutaneous flap vascularized by the radial artery. The forearm flap can be elevated and transferred on the superficial aspect. The lateral and medial ante brachial, basilica and medial antebrachinal veins are also included in the flap and constitute a portion of the venous drainage.

In the forearm flap as described by Chang and Hwang the shaft coverage is accomplished using the radial aspect of the skin paddle. A de-epitheliazed strip is created and a second skin island, on the ulnar aspect of the skin paddle is tubed to form the urethra. The urethral tube is them rolled within tube of skin to form a tube within a tube design. In the white population, this flap has demonstrated a tendency to lead to ischemic stenosis of the lateral paddle, where the urethra is constructed in the cricket bat modification the urethral tube extends distally, closed overlying either the radial or the ulnar artery.

The urethral portion is tubed and transported by inverting it into the center of the shaft portion of the skin paddle. The advantage of this modification lies in centering the urethral portion over the respective.

artery in contrast to the Chinese design, in which the ulnar aspect is far distal from the radial artery with the potential for ischemic stenosis or loss of the portion. Biemer's modification also centers the urethral portion of the flap over the artery.

Modifications of the Biemer design also include the glans construction technique that was originally described by Puckett and Montie in the original Biemer design, a central strip becomes the urethra, and lateral to that strip two epithelialized portions and two lateral islands (Lateral aspects of that skin paddle) are fused dorsally and ventrally to cover the shaft. With the Puckett modification (Pockett et al, 1982) a large island is left distal and flared back over penis. The Biemer design especially when it is combined with Puckett's design offers superior cosmetic results. The disadvantages to the use of forearm flap for phallic construction is an unsightly scar and cold intolerance.

MODIFIED PERINEAL URETHROSTOMY

Preserving the perineal part of the urethra and bringing it out through a button hole in perineum. They found that this facilitate micturition.

ESMASCULATION

Complete removal of scrotum and testis (EMASCULATION) was done along with total amputation to avoid scrotal skin excoriation and to improve the patient convenience while passing urine.But it doesnot have any survival advantage and not recommended now.

SURGERY FOR REGIONAL LYMPH NODES

The strategy for dealing with regional nodes may possibly be evolved on the following basis:

1. Only about 50% of the initially palpable nodes are histologically positive

2. About 20% of non-palpable nodes are likely to harbour malignancy.

3. Unless grossly enlarged pelvic nodes are usually difficult to palpate particularly in the obese.

4. In the case of unilateral involvement, chances of positive nodes on the opposite side are only about 25%. Estrom and Elsymer however reported 18 out of 30 cases positive in their series.

5. Even if inguinal nodes are positive, the chances of involvement of external iliac nodes are very low. Even when external iliac are involved, the disease seldom goes beyond the common iliac.

6. Palpable lymph nodes on initial examination often regress completely.

7. Lymph node biopsy or lymphangiography has limited application reliability.

8. Wait and watch policy is widely accepted as safe, provided patient can be trust to report for a regular follow up. Catulano cases coming in advanced stage if synchronous block was not carried out.

9. In countries like India, patients first report with advanced stage and if lymph nodes are not dealt with at the time of first time admission, they cannot be trusted to come for a regular follow up due to financial and other constraints.

10. Large fixed nodes need not be neoplastic. Part of the

mass or sometimes the entire mass can be

inflammatory.

11. Hemipelvectomy patients had 5 years survival rate more than others.

TECHNIQUE

Incisions: Vertical, Lazy vertical, Root and horizontal parallel, Lazy S and combination are used.

For standard inguinal bloc dissection an incision is made 2 cm above and parallel to the whole length of the inguinal ligament. The upper skin flap is reflected and the incision is deepened through the fat to expose the external oblique aponeurosis some 5 cm above the ligament. All fascial and glandular tissue is then stripped cleanly off the aponeurosis down to the level of the ligament, securing three small

arteries, the superficial circumflex iliac, the superficial epigastric and the superficial external pudendal together with their accompanying veins. The lower margin of the wound is strongly retracted, the long suphenous vein is divided between ligatures at least 10 cm below the ligarment and its stump is turned upwards together with all surrounding fat and lymph glands. The partially separated tissue is now stripped off the inguinal ligament from lateral to medial side. As this dissection proceeds, the small arteries already secured and the long saphenous vein are divided again at their junctions with the femoral vessels, which are now left clearly away from the medial side of the femoral vein and from the femoral canal.

PLAN OF TREATMENT OF INGUINAL NODES

Stage I and II (Tis, T1 – T4, N0, and M0) patients with carcinoma of penis with no palpable adenopathy require periodic examination of the inguinal area after treatment of the primary tumour. Most inguinal metastasis occurs within 2 to 3 months interval. Such a program requires also co-operation of the patient.

Stage III (Tis, T1 – T4, N1-N2, M0) patients with penile carcinoma and initial palpable adenopathy require control of the primary tumour followed by reevaluation of the inguinal nodes 2-6 weeks after infection is controlled and inflammatory adenopathy has resolved.

Simultaneous bilateral redical lymphadenectomy is varranted if Iymphadenopathy persists.

Stage IV (Tis, T1-T4, N3 & M1). This category includes patients with distant metastases or inguinal adenopathy that is inoperable due to invasion and fixation or to recurrence following surgery. Treatment is limited to palliative chemotherapy or radiotherapy.

COMPLICATIONS OF INGUINAL LYMPHADENECTOMY

Early complications are phlebitis, pulmonary embolism, wound infection and flap necrosis. Late complication is lymph edema.

RADIATION THERAPY

Assessment of the treatment of the inguinal area by primary radiation therapy is hampered by the uncertainty.

arising from the inaccuracy of the clinical staging and the frequent lack of histologic confirmation of nodal metastasis.

Objection to the treatement of the inguinal node metastasis are that the inguinal region tolerate radiation poorly and are subject to skin

Maceration and ulceration. Radiation therapy may be considered in patients presenting with inoperable fixed and ulcerative inguinal lymph nodes. Radiation therapy to inguinal area is not as effective therapeutically as lymph node dissection, but it may be used for palliation in the situation of the inoperable nodes.

CHEMOTHERAPY

This modality has the least application in the management of carcinoma of the penis, inclusive of carcinoma of urethral origin, Methotrexate, Blemycin, or Cisplatinum as a single drug therapy.

DOSAGE

Methotrexate 250 mg/m2 IV+leucovorin. To avoid adverse effects, 24 hours later 150 mg/m2 of leucovorin IV given. This was followed by 8 additional injections through a course lasting 2-4 weeks.

Bleomycin 3-20 mg/m2 as an infusion drip (10-30 mg/day or weekly bolus) till mucositis develops.

Cis platinum 70-120 mg/m2 IV every 3-5 weeks after administration was desirable. Pre hydration and mannitol diuresis is required.

The course was repeated after 4 weeks till 4-7 courses.

Day 1. Vincristine 1.5 mg/m2

Day 2. Bleomycin 7.5 mg/m2, Methotrexate 12.5 mg/m2

Day 3. Bleomycin 7.5 mg/m2, Methotrexate 121.5 mg/m2

COMBINED THERAPY

Combined modality approaches have been employed with some success in patients presenting with unresectable disease to convert the tumour to a totally respectable lesion.

NON SQUAMOUS MALIGNANCEY

BASAL CELL CARCINOMA

Although basal cell carcinoma is frequently encountered on other cutaneous surfaces, it is rare on the penis. Treatment is by local excision, which is virtually always curative.

MELANOMA

Melanoma presents as a blue-black or reddish brown pigmented papule, plaque, or ulceration on the glans penis. It occurs on the prepuce less frequent. Diagnosis is made by histologic examination of biopsy speciments, which demonstrate atypical junction cell activity with displacement of the pigment cells into the dermis. Distant metastatic spread has been found in 60% of the patients.

Haematogenous metastasis occurs by means of the vascular structures of the corporeal bodies; 1ymphatice spread to the regional ilioinguinal nodes occurs by 1ymphatic permeation. Surgery is the primary mode of treatment, with radiotherapy and chemotherapy being of only adjunctive or palliative benefit. For Stage I melanoma (localized one regional area), adequate excision of the primary tumour by partial or total penile amputation together with enbloc bilateral ilioinguinal block dissection offers the greatest prospect for cure.

SARCOMAS

Primary mesenchymal tumors of the penis are rare. The patients ranged in age from newborn to the seventies. The presenting signs and symptoms of subcutaneous mass, penile pain and enlargement, priapism, and urinary obstruction where the same for both benign and malignant lesions. Malignant lesions were found more frequently on the proximal shaft. The most common malignant lesions were those of vascular origin (hemangioepithelioma), followed in frequency by those of neural, myogenic, and fibrous origin.

Wide local surface excision and partial penile amputation for the superficial tumours have been suggested. Total penile amputation has been reserved for tumours of deep corporeal origin. Local recurrences however are characteristic of sarcomas. (Dehner and Smith, 1970). To avoid local recurrences, a total amputation, even for superficial malignancies of any cell type, should be considered.

PAGET'S DISEASE

Paget's disease of the penis is extremely rare. It appear grossly as an erythematous, eczematoid, well demarcated area that cannot be clinically distinguished from erythroplasia of Queyrat, Bowen's disease, or carcinoma in situ of penis. Clinical presentation includes local

Discomfort, pruritus, and occasionally a serosanguinous discharge. On microscopic examination, identification is clearly made by the presence of large, round or oval, clear staining hydropic cells with hypo chromatic nuclei (i.e. Paget cells)

Paget's disease may often herald a deeply seated carcinoma with Paget cells moving through ducts or 1ymphatics to the epidermal surface. In the penis, a sweat gland carcinoma (Mitsudo et all, 1981) or periurethral gland adenocarcinorma (Jenkins, 1989) may be the primary neoplasm. Complete local excision of the skin and the subcutaneous tissue is the recommended form of therapy. If inguinal adenopathy is present, radical node dissection is advised (Hagan et al, 1975). Careful observation for recurrence at the margins is necessary.

LYMPHORETICULAR MALIGNANCY

Primary 1ymphoreticular malignancy rarely occurs on the penis. Leukemia may infiltrate the corpora, resulting in pain and priapism. When 1ymphomatous infiltration of the penis diagnosed, a thorough search for systemic disease is necessary. If the penile lesion is indeed a primary tumour, treatment with systemic chemotherapy may be used. It is the most effective therapy for local disease, for potential occult deposits that may exist elsewhere, and for preservation of form and function (Marks et al 1988). Local low-dose irradiation has also been reported to be successful. Kaposi's sarcoma, usually a cutaneous

manifestation of a generalized 1ymphoreticular disorder, may produce genital lesions and is now most frequently associated with AIDS.

METASTASIS

Metastatic lesions to the penis are unusual. Renal and respiratory neoplasms have also metastasized to the penis. The most frequent sign of penile metastasis is priapism. Penile swelling, nodularity, and ulceration have also been reported. Penile metastasis represents an advanced form of virulent disease and usually appears rather rapidly after recognition and treatment of the primary lesion. Because of the association of a penile metastatic lesion with advanced disease, survival after its presentation is limited, and the majority of patients die within one year.

PROGNOSIS OF CARCINOMA PENIS

In the early cases an 80-100% 5 year survival can be expected in Jackson's Stage I disease, 67% in Stage II, 29% in Stage III, and 0% in Stage IV. If 1ymph nodes are histologically negative the survival is 80-90% but once the nodes are positive, survival drops to 70% if one noe is involved and 25-40% if more than one is involved. Age and amount of differentiation could be a prognostice factor.

CASE ANALYSIS

CASE ANALYSIS

30 patients with a proven diagnosis of carcinoma of penis, admitted between May 2007 and September 2009 in this institution was taken up for the study.

AIM OF STUDY

The aim of the study is to analyse the predisposing factors, stage at presentation, regional 1ymph nodes in the stages, the type of surgery done and the prognosis in the patients with carcinoma of penis.

AGE:

Most of the patients, who attended the hospital with carcinoma penis, were between 40 and 70 years of age. The youngest was found to be 32 years and oldest 78 years of age.

TABLE 1

Age group in our series as compared with other Authors

Age group in years	S.P. Srivastava 1963	Prabakar et al 1976	In our series	
			No of cases	Percentage
31-40	17.70	08.60	6	10
41-50	34.14	17.80	9	30
51-60	29.26	31.00	9	30
61-70	03.60	27.70	6	20
71-80	0	09.30	3	10
81-90	0	01.60	0	00
91-100	0	00.70	0	00

RELIGION

Among the 30 cases 29 were Hindus. Only one Christian. There were no Muslims detected in the study, probably because of the practice of circumcision in the Muslim community.

TABLE 2

Religion incidence in our series

Total no cases	No. of Muslims	No. of Christians	No. of Hindus
30	0	1	29

INCIDENCE

Most reports are based on hospital statistics which consists of a highly filtered material and may reflect the current incidence. In the absence of National or Regional registry therefore the incidence figures are low for countries of religious of religious groups which practice ritual circumcision but they are also low in countries like Denmark or Japan which do not. Hanash found an incidence of 2.64% of male malignancies in U.S.A. Narayanan et al from the same country reported an incidence of 2% of all male genital malignancies. They are also observed a drop in incidence with years. Norman et al from Canada found an incidence of 4.92/1, 00,000 males reported by Reddy et al from Vishakapatnam in India. Hoppman and Fralely reported to be 12% but in

Gieu tribe in the same country; this tribe practices the ritual circumcision. The incidence reported in Koreans is 4% while it was 10.3% among the Chinese. In U.S.A. again the Blacks are 3.5 times more prone to it than Whites. Dodge reviewed the tumor registry at Kampala in East Africa and found that constituted 1% of all cancers and 1.9% male carcinoma were that of penis. Paymaster found an incidence of 2.8% of all tumours in Mumbai. Reddy et al reported an incident of 6.9% of all tumors in Visakapatnam and 13.79% of all male malignancies. Panda and Nayal from Orissa reported an incidence of 4.5-5% of all male carcinoma. The overall incidence based on hospital records at Pondicherry was 2.64% of all cancers and 4.9% of cancer in the male. The figures for Agra were 30.2% and 63.79% respectively. The disease constituted 87.1% of male genitor urinary cancer. A figure remarkably high from Western standards, where the commonest tumour would be prostatic followed by the urinary bladder, carcinoma penis being the least common.

Carcinoma of the penis was detected in 2% of all the male patients admitted with malignancies. The incidence has reduced recently. In the late 90's roughly more than 50 patients with carcinoma penis, were treated in this institution. Most of the patients who are admitted with carcinoma penis were from poor socio economical status, uneducated, coolies, who do not have the habit of cleaning the prepuce and the glans penis during their daily bath. For the past 2 years only 23 cases of carcinorma penis were treated in this institution.

Most of the patients developed growth or ulcer in uncircumcised penis. The onset was spontaneous without any history of trauma.

The history of STD was found in only one case in which VDRL was reactive. The other patients were non reactive.

Out of the 30 patients 18 patients of Ca. Penis presented with proliferative growth and 12 patients with ulcer.

TABLE 3

Showing different varieties of Ca. of penis in our series

Varieties	No. of cases	Percentage
Proliferative	18	60
Ulcerative	12	40

Out of the 30 patients in this study, 6 cases that had ulcerative lesions and 9 cases that had proliferative growth had inguinal deposits. 6 patients of the 30 patients had hard, fixed, inguinal 1ymph nodes. The involvement of the superficial inguinal nodes was more. The deep inguinal nodal involvement was found in only one case.

TABLE 4

STATUS OF REGIONAL LYMPH NODES

Gland involvement	No. of cases	Percentage
No glands	9	30
Enlarged & mobile	15	50
Enlarged & fixed	6	20
External iliac gland	0	0

15 patients had secondary deposits in inguinal nodes discovered by FNAC. The remaining was found to be of inflammatory origin. This subsided with antibiotic treatment.

TABLE 5

Showing different varieties of Ca. penis with 1ymph node involvement

Varieties	No. of cases	Percentage
Proliferative	9/30	66.6
Ulcerative	6/30	33.3

Most of the patients with Ca. Penis presented at stages IIor III. 3 patients presented with stage I and 6 were in stage IV.

TABLE 6

Stage	No. of cases	Percentage
Stage I	3	10
Stage II	12	40
Stage III	9	30
Stage IV	6	20

Most of the patients with Ca. Penis presented at stages II or III. 3 patients presented with stage I and 6 were in stage IV

The main complaints were growth in the penis, pain and foul smelling discharge

Out of the 30 Patients with Ca. Penis, 6 patients underwent partial amputation of penis. 12 patients underwent total amputation with perineal urethrostomy. Among 15 patients with inguinal nodal involvement 4 underwent unilateral and 1 underwent bilateral inguinal block dissection.

After confirming tissue biopsy for primary tumour and FNAC for 1ymph nodes the treatment was planned.

Biopsy reports were positive for squamous cell carcinoma in all the cases. Of 22 cases with nodes for whom FNAC was sent, the reports were positive in 15 cases for secondary deposits. Due to the non availability of frozen section biopsy this was not used preoperatively.

Out of 6 cases with fixed inguinal nodes 2 cases treated with palliative radiotherapy. 4 combined(RT+CT)

TABLE 7

DIFFERENT MODALITIES OF TREATMENT GIVEN TO OUR PATIENTS

Type of treatment	No. of cases	Percentage
Circumcision	0	0
Partial amputation	6	20
Total amputation with perineal urethrostomy	15	50
Total amputation with inguinal block dissection	U/L- 5 B/L-1	20
Adjuvant RT/CT	6	
Primary RT/CT	3	10

COMPLICATIONS & FOLLOW UP

Partial Amputation :

Out of 6 patients who underwent partial amputation 1 developed meatal stenosis for which urethral dilatation was done. Only 2 were passing urine in standing posture & 3 patients were able to resume their sexual activity.

Total Amputation :

Of the 15 patients , 5 had wound gaping , managed conservatively.

Inguinal block Dissection :

Out of 6 patients , 1 died on 1st POD due to uncontrolled haemmorage from femoral vessel. 2 patients had seroma, 1 had skin necrosis.

DISCUSSION

DISCUSSION

Most of the patients with carcinoma penis belonged to the forty to sixty age group. Muslims were free of the disease due to early circumcision.

Of late the incidence of CA penis has been reducing due to the awareness among public population.

Most of the patients with CA penis belong to poor socio economic groups were uneducated and are not aware of personal hygiene and this disease.

Majority of the patients with CA penis presented with proliferated growth and few inguinal node involvement. Minority of patients presented with ulcerative growth but had more involvement of inguinal nodes.

The glans penis and prepuce were the most involved in CA penis. The shaft and corona were involved in less number of cases.

Biopsy reports of all the patients were reported as squamous cell carcinoma.

Most of the patients underwent partial or total amputation with perineal urethrostomy.

For operable inguinal node involvement, a ‘Wait and Watch” policy was adopted in majority and after six weeks inguinal block dissection was planned, but only a few turned up . In others Ilioinguinal block dissection along with partial/Total amputation was carried out.

Most of patients are able to cope with morbidity following surgery .

For inoperable cases RT / CT given.

Few patients who turned up for followup presented with inoperable lymphadenopathy for whom RT/CT was given.

SUMMARY

SUMMARY

This dissertation is submitted with collection of 30 cases of carcinoma of penis.

1. Most patients are between 41-60 years.
2. Majority of the patients are from rural areas and from socially low economic group.
3. Phimosis and poor personal hygiene of cases form major predisposing factors.
4. Total amputation is the treatment of choice for shaft involvement.
5. Block dissection should be done for all FNAC proven mobile metastatic nodes.
6. Wait &Watch policy regarding inguinal lymphadenopathy should be weighed with caution.
7. RT/CT is the treatment of choice for advanced / inoperable cases.
8. Much of morbidity/mortality can be avoided through proper personal hygiene and seeking proper medical advice at early stage.

CONCLUSION

CONCLUSION

The carcinoma of penis occurs more common in the age group between 40-60 yrs.

The neonatal circumcision is the only way to prevent the carcinoma of penis.

The early diagnosis and treatment decrease the mortality and improve the 5 year survival rate.

The surgery is the mainstay of treating the carcinoma of penis.

The other modalities of treatment will be adjuvant not the main treatment.

Creating awareness in public is the only way to reduce the mortality and morbidity due to carcinoma of penis.

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BIBLIOGRAPHY

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PROFORMA

Name :

Age :

IP No. :

Address :

Occupation :

Religion :

D.O.A :

D.O.S :

D.O.D. :

Complaints

1. Proliferative growth –
2. Pain & Dysuria –
3. Bleeding on touch –
4. Ulcer
5. Foul smelling discharge –
6. Itching –
7. Fistulous tract from the growth
8. Retention of urine –
9. Inguinal swelling

History of Present illness:

Ulcer :

1. Site –
2. Size –
3. Duration –
4. Progression –

Past history : History of

1. Phimosis
2. Balanoposthitis
3. Warty lesions
4. Previous surgery
5. Trauma
6. Exposure to STD

H/o Diabetes Mellitus / Hypertension

Personal History:

1. Diet
2. Smoking
3. Alcoholic

General Examination:

Built
Nutritional status
Anemia
Weight
Pulse
BP
Generalized 1ymphadenopathy

Local Examination:

Primary tumor :

Inspection :

Growth/Ulcer : Site
Size
Shape
Extent

Edge
Margin
Floor

Palapation:

Warmth
Tenderness
Inspectory findings
Base
Induration

Regional Lymph Modes:

Size
Number
Mobility — Mobile
Fixed

Consistency — Firm
Hard

Unilateral/Bilateral

P/A : Liver –
Spleen –
Other masses –

P/R : Perineal body involvement
Other masses

Management

Investigations:

a) General

1. Urine
- Albumin
- Sugar
- Deposits
- C/S

2. CHG

    Hb%
    TC
    DC
    ESR

3. Blood urea
4. Blood sugar
5. Serum creatinine
6. LFT
7. USG abdomen
8. Chest X-ray PA view
9. ECG

b) For Primary:

    Biopsy

c) For Regional Nodes:

    FNAC/Biopsy

    CT Scan

d) For distant metastasis:

    1. CT Chest
    2. MRI
    3. Bone scan
    4. Serum calcium

Treatment:

For primary tumour

1. Surgery:
    a) Partial amputation
    b) Total amputation with perineal urethrostomy
2. Radiotherapy
3. Chemotherapy

For regional 1ymph node metastasis

1. Operable
    a. Unilateral – I1io – inguinal block dissection
    b. Bilateral I1io inguinal block dissection

2. Inoperable:
    a. Radiotherapy
    b. Chemotherapy
    c. Combined

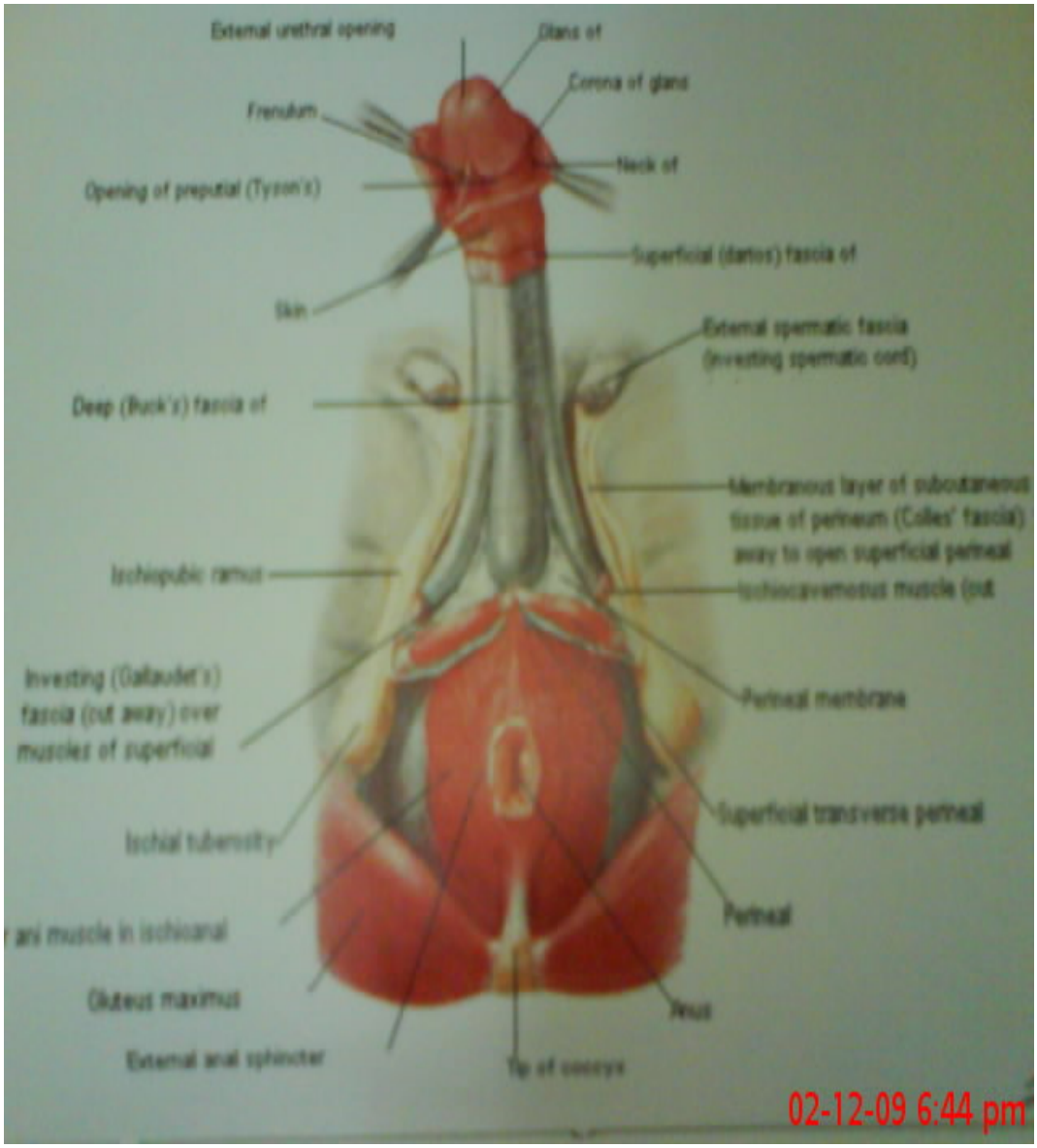
Follow up for 2 years

Disease free
Inguinal metastasis
Stump recurrence (Partial amputation)
Distant metastasis, Death.

ANNEXURES

PHOTOS

PENIS


External urethral opening
Glans of
Corona of glans
Frenulum
Neck of
Opening of preputial (Tyson's)
Superficial (dartos) fascia of
Skin
External spermatic fascia
(investing spermatic cord)
Deep (Buck's) fascia of
Membranous layer of subcutaneous
tissue of perineum (Colles' fascia)
Ischiopubic ramus
Investing (Gallaudet's)
fascia (cut away) over
muscles of superficial
Perineal membrane
Superficial transverse perineal
Ischial tuberosity
Perineal
Gluteus maximus
Anus
External anal sphincter
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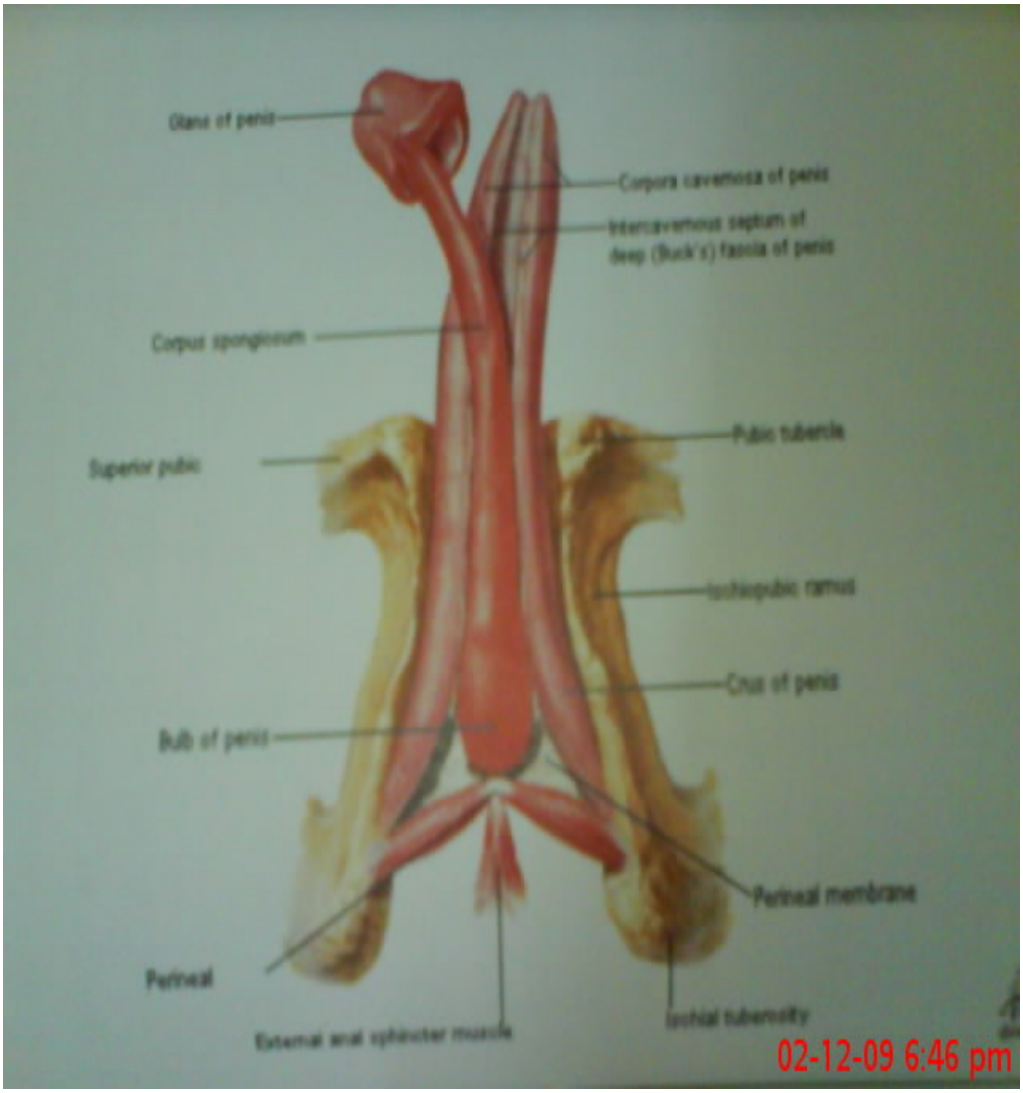
ANATOMY-PENIS



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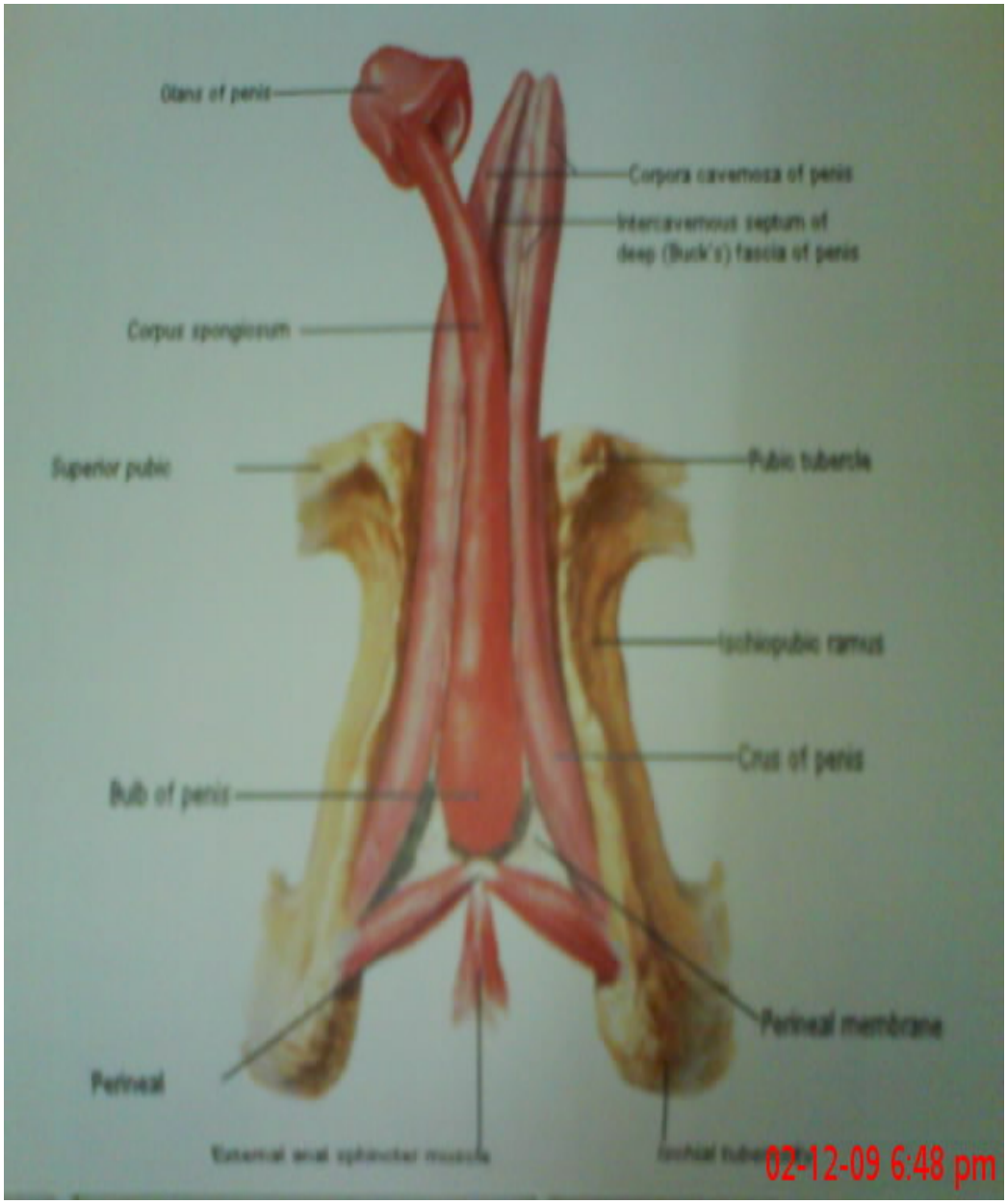

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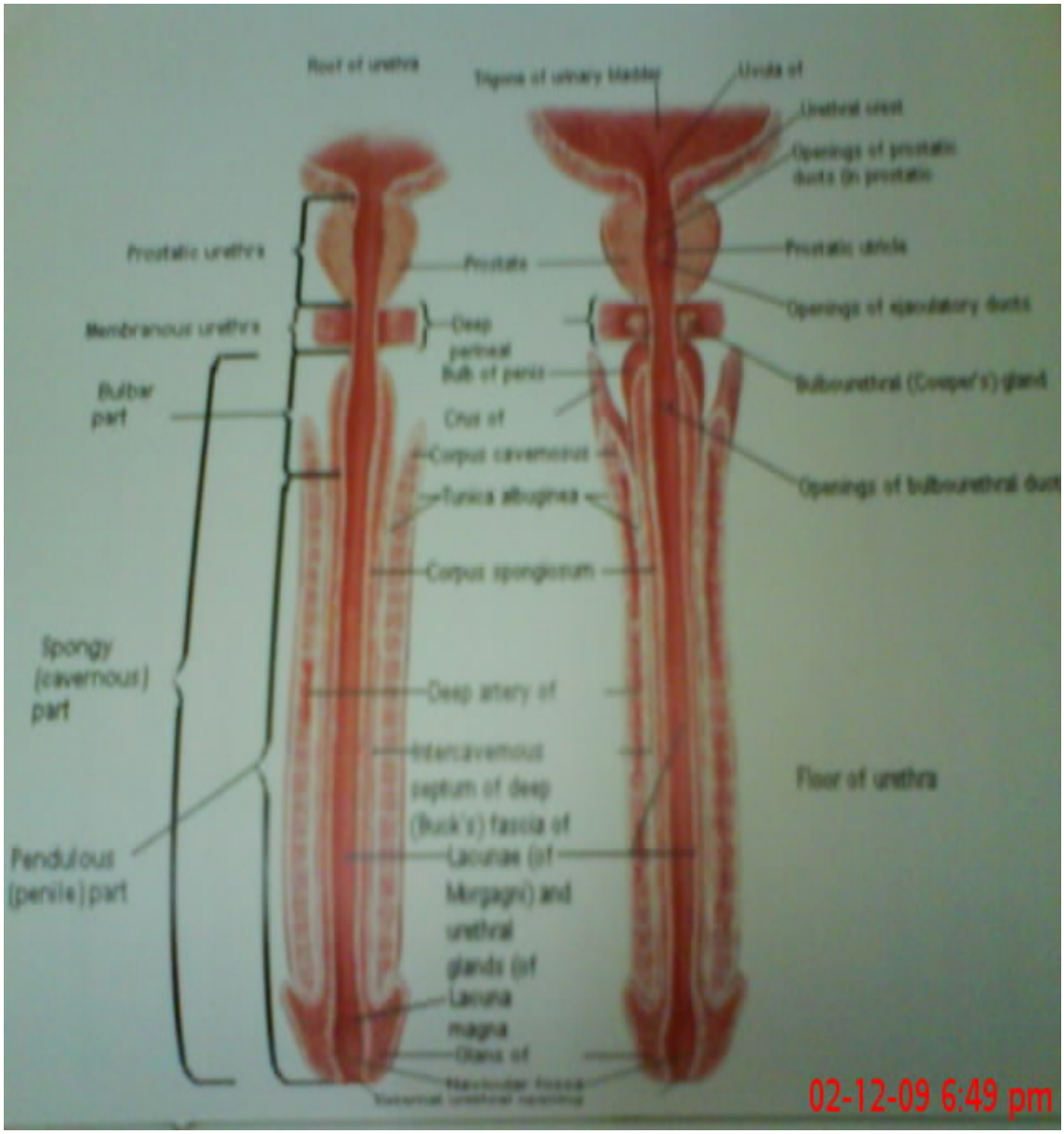

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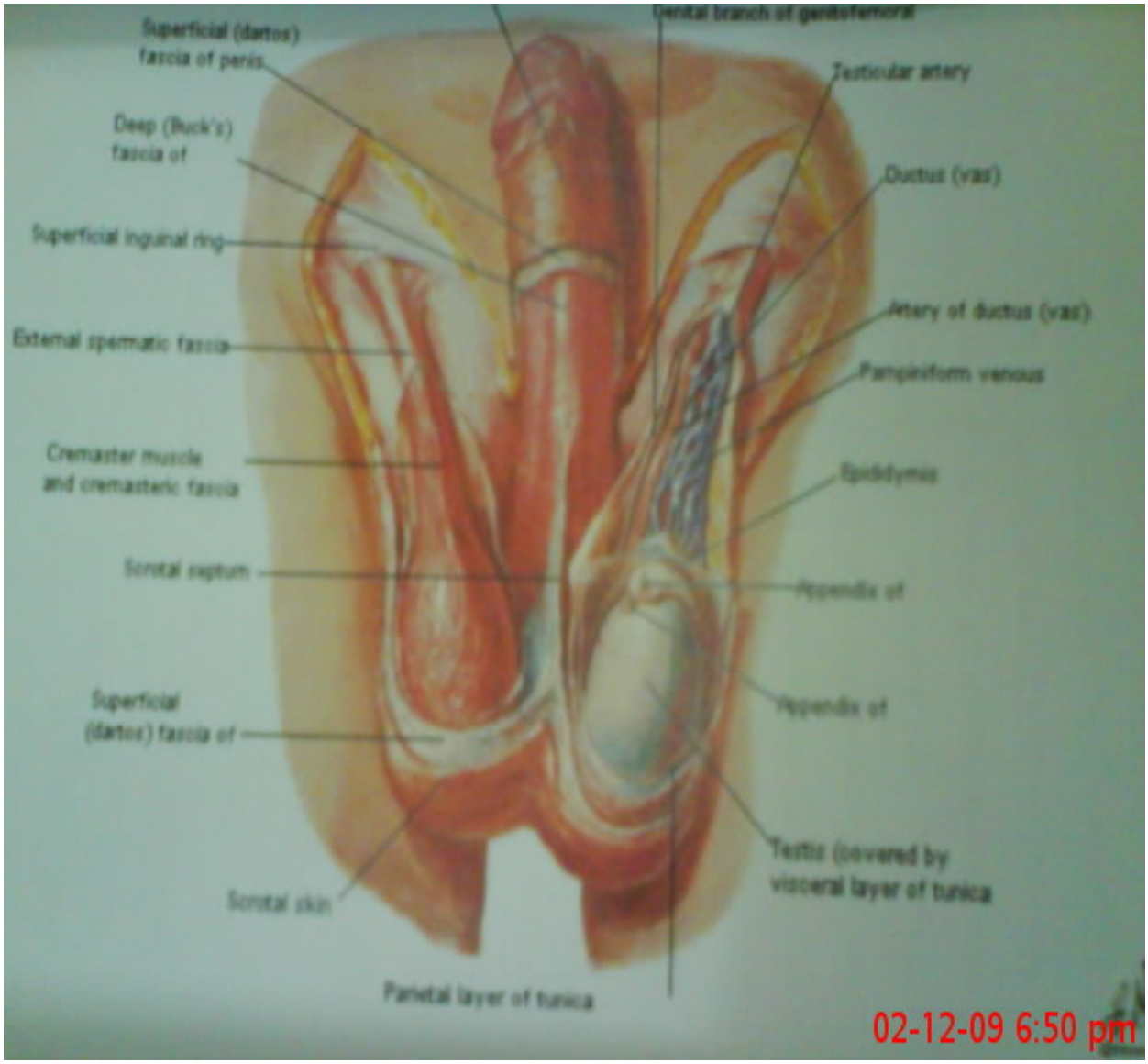
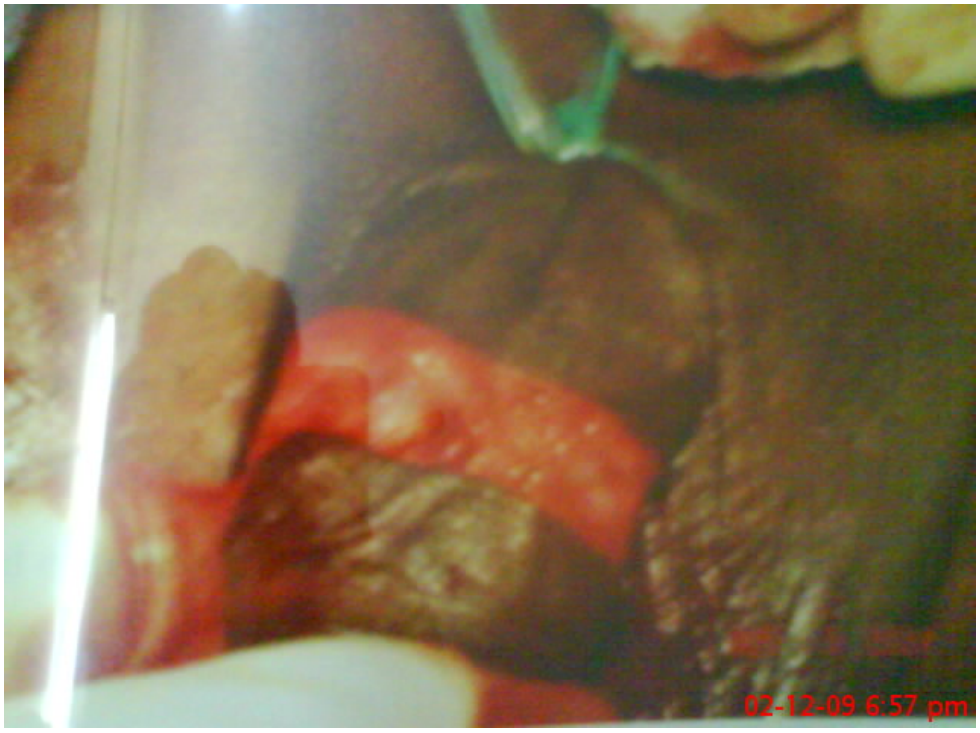


CA.PENIS

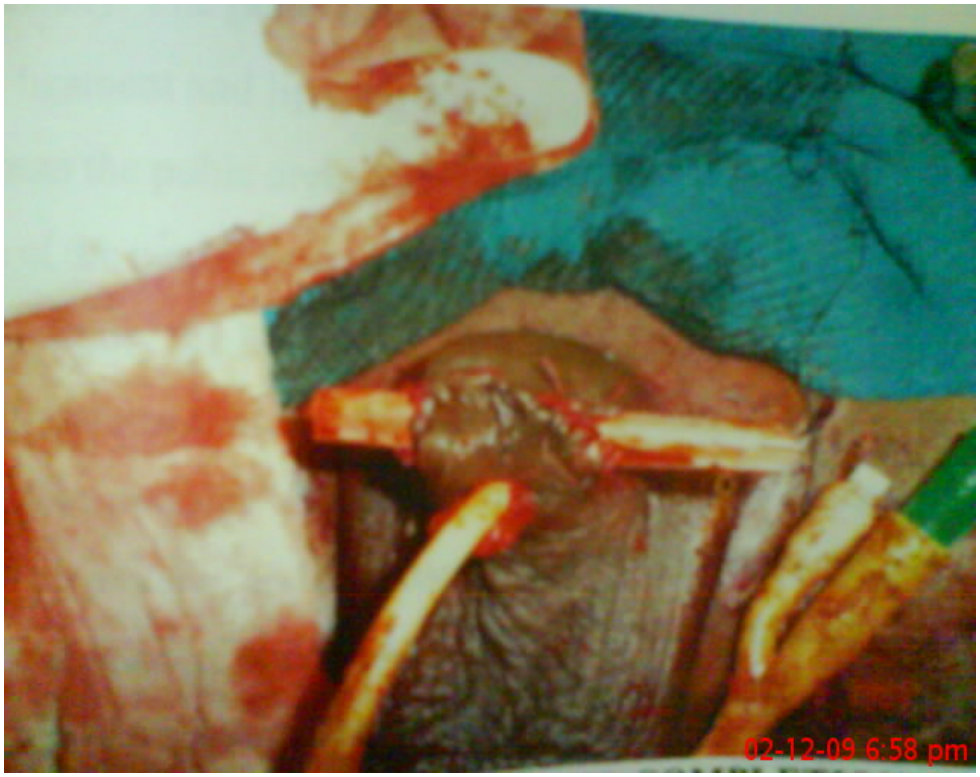
Ca PENIS T2

PENILE Ca WITH Rt INGUINAL METASTASIS

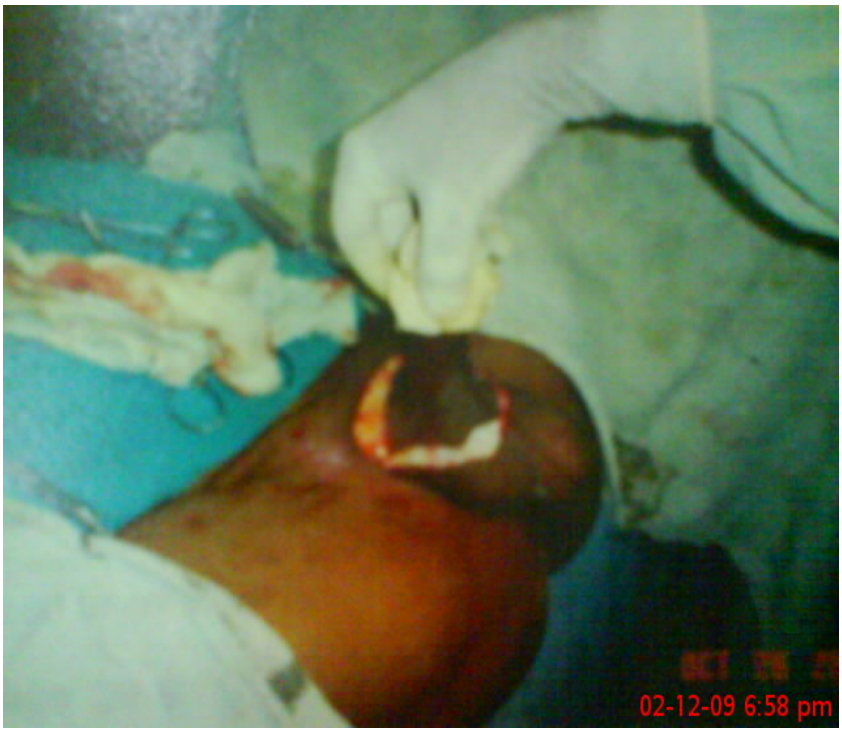
PARTIAL AMPUTATION INCISION

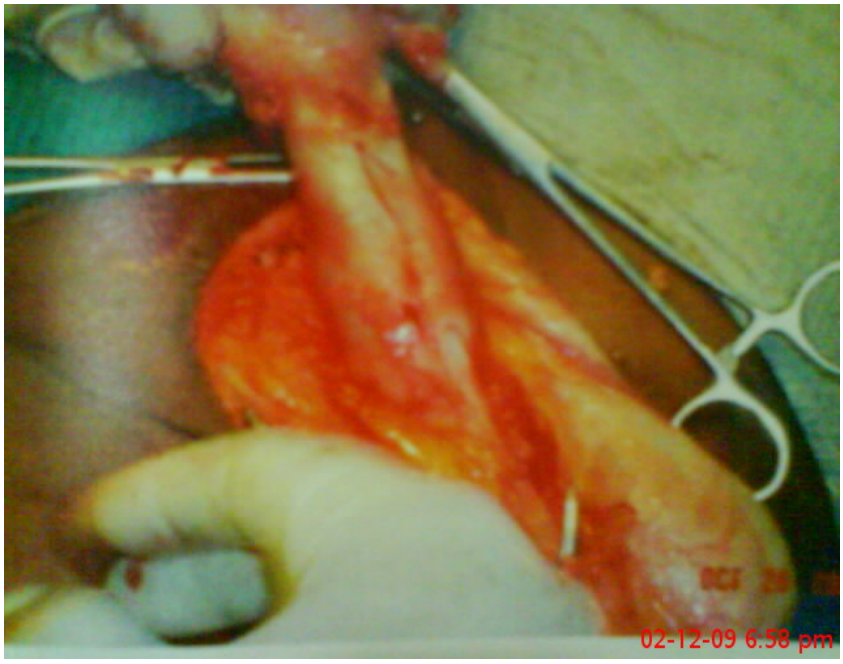


PARTIAL AMPUTATION AFTER COMPLETION

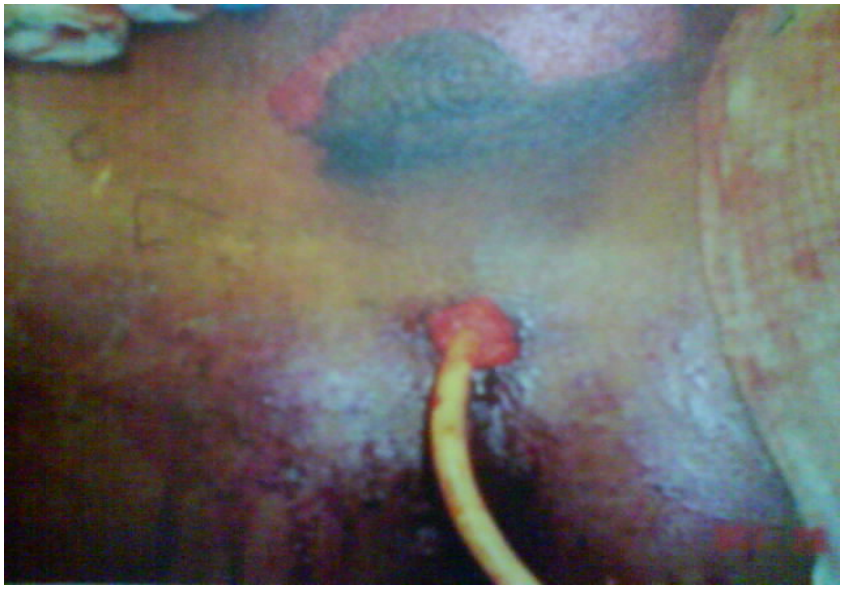


TOTAL AMPUTATION PENIS

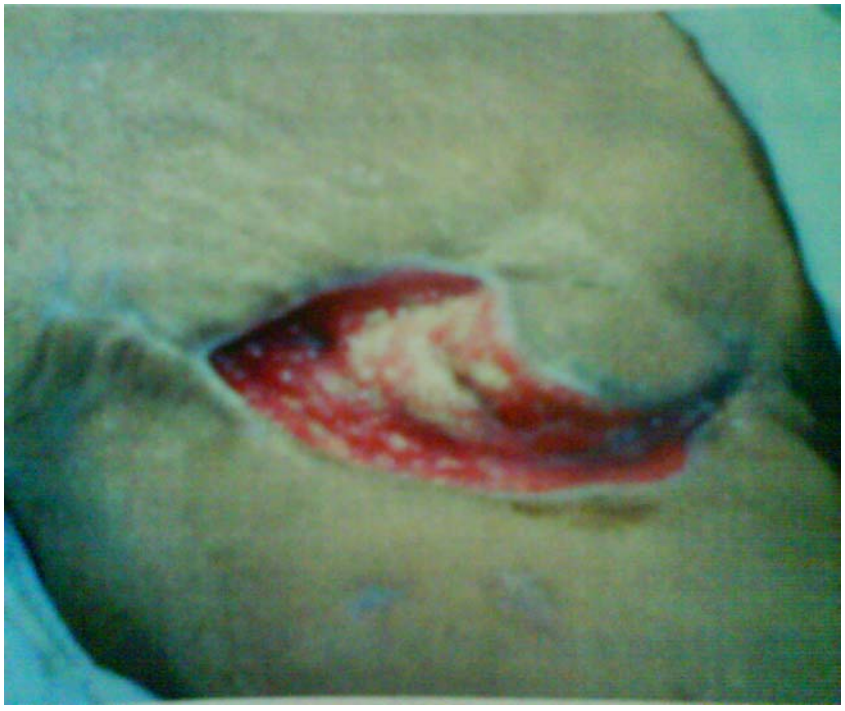




PERINEAL URETHROSTOMY

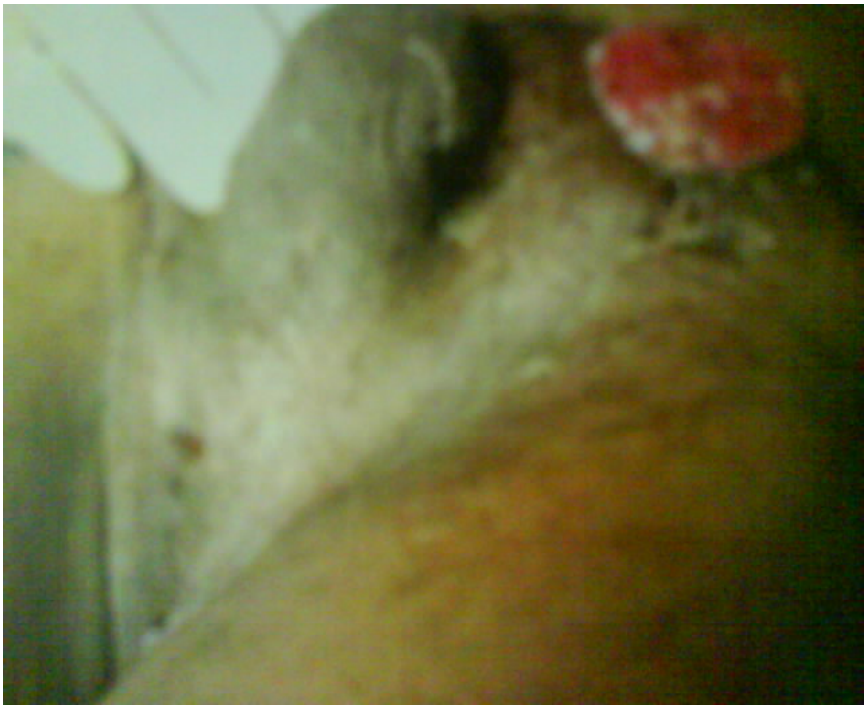


INGUINAL BLOCK DISSECTION WITH TRAM FLAP NECROSIS



VERRUCOUS.CA

INGUINAL LYMPHADENOPATHY WITH NECROSIS



MASTER CHART

MASTER CHART

S.No	IP No	Age	Stage	Amputation		Lymphadenectomy		RT	CT
				Partial	Total	U/L	B/L		
1.	20081	48	II		T				
2.	25269	52	III		T	+			
3.	28528	68	IV		T			+	+
4.	29526	38	II	P					
5.	31238	47	III		T		+		
6.	33508	53	II		T				
7.	35562	72	III		T			+	+
8.	36825	58	IV		T			+	+
9.	39583	56	II		T				
10.	39862	32	II	P					
11.	41326	45	I	P					
12.	42791	73	IV					+	+
13.	43998	43	II		T				
14.	45526	39	I	P					
15.	46282	61	III		T	+			
16.	47921	49	II		T				
17.	48128	57	III		T	+		+	+
18.	48562	36	II	P					
19.	49327	68	III		T				
20.	51262	63	III		T			+	+
21.	51899	58	II		T				
22.	52908	78	IV					+	+
23.	53007	52	III		T	+			
24.	53286	38	II		T				
25.	54921	65	IV					+	+
26.	55282	54	II		T				
27.	56821	37	II	P					
28.	57988	61	III		T	+			
29.	58061	56	IV		T			+	+
30.	58137	48	II		T				

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CERTIFICATE

Certified that this is the bonafide dissertation done by **Dr.A.JOSEPH STALIN A.MUTHU** and submitted in partial fulfillment of the requirements for the Degree of M.S., General Surgery, Branch I of The Tamilnadu Dr. M.G.R. Medical University, Chennai.

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Date : Professor & Head
Department of Surgery

Date : Dean
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DECLARATION

I solemnly declare that the dissertation titled **"A STUDY ON MANAGEMENT OF CARCINOMA PENIS"** was done by me from 2007 onwards under the guidance and supervision of

Professor Dr. A. Ramamoorthy M.S.

This dissertation is submitted to the Tamilnadu Dr. MGR Medical University towards the partial fulfillment of the requirement for the award of MS Degree in General Surgery (Branch I).

Place : **Dr. A.JOSEPH STALIN**

Date :

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