

**A COMPREHENSIVE STUDY ON SELECTIVE NECK  
DISSECTION IN MEASURING OUTCOME AND  
PROGNOSIS IN OPERABLE ORAL CAVITY  
MALIGNANCY WITH N0 NECK NODE**

*This dissertation is submitted to*

**THE TAMILNADU DR. MGR MEDICAL UNIVERSITY**

*In partial fulfillment of the requirements for*

**M.S. DEGREE BRANCH-IV  
OTORHINOLARYNGOLOGY**

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



**UPGRADED INTITUTUE OF OTORHINOLARYNGOLOGY  
MADRAS MEDICAL COLLEGE**

**CHENNAI-600 003.**

**MAY- 2020**

## **CERTIFICATE**

This is to certify that this dissertation entailed “**A COMPREHENSIVE STUDY ON SELECTIVE NECK DISSECTION IN MEASURING OUTCOME AND PROGNOSIS IN OPERABLE ORAL CAVITY MALIGNANCY WITH N0 NECK NODE**” submitted by **Dr.JOTHIESWARAN.K**, appearing for **M.S. ENT., Branch IV** Degree examination in May 2020 is a bonafide record of work done by her under my direct guidance and supervision in partial fulfillment of regulations of the Tamil Nadu Dr. M.G.R. Medical University, Chennai, Tamil Nadu, India.

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## **DECLARATION**

I solemnly declare that the dissertation “**A COMPREHENSIVE STUDY ON SELECTIVE NECK DISSECTION IN MEASURING OUTCOME AND PROGNOSIS IN OPERABLE ORAL CAVITY MALIGNANCY WITH N0 NECK NODE**” is done by me at the Madras Medical College and Government General Hospital, Chennai during 2017-2019 under the guidance and supervision of Prof. **Dr.F.ANTHONY IRUDHAYARAJAN M.S., D.L.O.,**

This dissertation is submitted to The Tamilnadu Dr. M.G.R. Medical University, towards partial fulfillment of regulation for the award of **M.S. DEGREE IN OTORHINOLARYNGOLOGY (BRANCH-IV)**

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## **ACKNOWLEDGEMENT**

First and foremost, I am immensely thankful to my guide **Prof.Dr.F.ANTHONY IRUDHAYARAJAN, M.S. D.L.O..**, The Professor, Upgraded Institute of Otorhinolaryngology, for his invaluable support and encouragement. His constant guidance and inquisitive analysis enabled me to conduct this study meticulously.

I am grateful to **Prof.Dr.R.MUTHUKUMAR MS., DLO., DNB.**, Professor and Head of department, Upgraded Institute of Otorhinolaryngology for his valuable support and guidance during the study.

I am grateful to **Prof.Dr.N.SURESHKUMAR MS DLO.**, Professor, Upgraded Institute of Otorhinolaryngology for his valuable support and guidance during the study.

I am grateful to **Prof.Dr.M.N.SHANKAR MS., DLO.**, Professor, Upgraded Institute of Otorhinolaryngology for his valuable support and guidance during the study.

I am also grateful to **Prof.Dr.BHARATHIMOHAN, MS., DLO., Prof. Dr.RAJENDIRAN., Prof. Dr.INDRA, MS., DLO.,**

I express my gratitude to **Prof. Dr.JAYANTHI, MD., FRCS, THE DEAN**, Madras Medical College, for having permitted me to use the hospital material in this study.

I thank the Secretary and Chairman of Institutional Ethical Committee, Government General Hospital and Madras Medical College, Chennai for permitting me to conduct the study .

I would like to thank Associate Professor **Dr. NANMULLAI MS** for his guidance in conducting the study.

I would like to thank Assistant Professor, **Dr.CHANDRAMOULI, MS, DR.SENGOTUVELU, MS., DLO., Dr.(MAJOR) J.NIRMAL KUMAR, MS., Dr.VIGNESH, MS.,** for their support in conducting the study.

I express my sincere thanks to all the Assistant Professors for their thoughtful guidance.

I take immense pleasure to thank my parents for their unconditional love, care and support that has led to the fulfillment of this study.

I express my appreciation for the generosity shown by all the patients who participated in the study.

Above all, I thank God Almighty for his immense blessings.

## **ABBREVIATIONS**

END	:	Elective neck dissection
SOHND	:	Supraomohyoid neck dissection
SCC	:	Squamous cell carcinoma
USG	:	Ultrasonography
CT	:	Computerised tomography
PET	:	Positron emission tomography
ENI	:	Elective neck irradiation
DSS	:	Disease specific survival
HPE	:	Histopathological examination

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## **AIMS AND OBJECTIVES**

- 1) To study the rationale of selective neck dissection in Oral Cavity tumors with N0 Neck Node.
- 2) To study the correlation of size, site, stage , grade and growth pattern of the tumor with rate of occult positivity of neck nodes
- 3) To analyze about outcome and prognosis of the treatment

## **BACKGROUND**

Squamous cell carcinoma constitute the most common type of head and neck malignancy. Oral cavity malignancy accounts for 14% of all head and neck cancers. In the oral cavity, tongue is the most common subsite.

Head and neck cancer remains significant global public health problem with more than 4, 50,000 new cases worldwide every year. Oral cavity cancers are more common in Southeast Asia. India accounts for more than ¼ of world burden. Oral cavity cancers are more aggressive tumor and tongue is the most common subsite. Oral cancers are top ranking among men and 4<sup>th</sup> among women. High incidence is attributed due to widespread use of tobacco and alcohol.

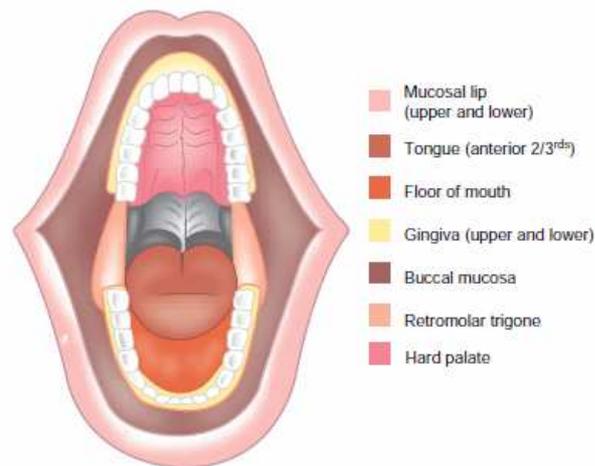
Single most important prognostic factor in oral cavity cancer is cervical node metastasis. More than 50% of patients with squamous cell carcinoma of oral cavity have lymph node metastasis. Lymph node metastasis from the oral cavity tumors occurs in a predictable and sequential manner. For primary tumors of the oral cavity first echelon lymph node at highest risk for early dissemination include level I, II, III .Among the patients with

clinically negative neck incidence of occult metastasis varies with site, size and thickness of tumor. There is no reliable parameter to predict the occult metastasis.

# ORAL CAVITY – ANATOMY

## INTRODUCTION

*Fig:1*



The oral cavity starts from the skin-vermillion junction of the lips and ends superiorly up to the junction of the hard and soft palate and inferiorly up to the line of the circumvallate papillae.

The subsites are

- ❖ Mucosal lip
- ❖ Buccal mucosa
- ❖ Lower alveolar ridge
- ❖ Upper alveolar ridge
- ❖ Retromolar trigone
- ❖ Floor of the mouth

- ❖ Hard palate
- ❖ Anterior two thirds of the tongue (oral tongue)

## TONGUE

- ❖ The tongue is a highly muscular organ needed in deglutition, taste and speech.
- ❖ It has dorsal surface, ventral surfaces, a root and an apex.
- ❖ It is divided as anterior  $2/3^{\text{rd}}$  and posterior  $1/3^{\text{rd}}$  by sulcus terminalis, a line which runs from foramen caecum, anteriorly and laterally up to palatoglossal arches.
- ❖ **Anterior  $2/3^{\text{rd}}$**  of tongue is related with hard & soft palate above, incisor teeth near the tip/apex, lateral margins are in relation with junction of gums and teeth.
- ❖ The ventral or inferior surface of the tongue is smooth, purplish and reflected on to the oral floor and gums.
- ❖ The median mucosal fold present anteriorly is called as the lingual frenum. Deep lingual vein present lateral to this fold on either side.
- ❖ The fringed mucosal ridge lateral to the vein is called as the plica fimbriata.

- ❖ **Posterior 1/3<sup>rd</sup>** - Its mucosa is reflected on to the epiglottis posteriorly by a median and two lateral glossoepiglottic folds.
- ❖ Two depressions present within this folds are called as valleculae.
- ❖ The pharyngeal part of the tongue has underlying lymphoid nodules that produce low-surface elevations collectively termed the lingual tonsil.
- ❖ The ducts of small seromucous glands opens on the apices of these elevations.

#### **TYPES OF PAPILLAE**

- ❖ Fungiform papillae
- ❖ Circumvallate papillae
- ❖ Filiform papillae
- ❖ Except filiform papillae all papillae bear taste buds.
- ❖ The keratinized conical or cylindrical minute **filiform papillae** are numerous & arranged in parallel to sulcus terminalis, but transverse near the tip.

- ❖ They have masticatory function, serves to increase the friction between the tongue and food, facilitating the movement within the oral cavity.
- ❖ The **fungiform papillae** arranged scattered on the lingual margin and also irregularly arranged on the dorsal surface.
- ❖ They are larger in size, round (mushroom) in shape and deep red color (thin, non-keratinized & have highly vascular connective tissue core).
- ❖ The **circumvallate papillae** are cylindrical structures, 1–2 mm in diameter, varying in number from about 8 to 12.
- ❖ They form a V-shaped row immediately in front of the sulcus terminalis and each one of them is circumscribed by a groove. It forms the anterior wall of the oropharynx.

## MUSCLES OF TONGUE:

*Table:1 Extrinsic Muscles*

Muscle	Origin	Insertion	Action
Genioglossus (safety muscle of tongue)	Genial tubercle of mandible	Tongue	Retract and depress the tongue
Hyoglossus	Hyoid bone	Posterior half of the side of the tongue	Depress the tongue

<b>Muscle</b>	<b>Origin</b>	<b>Insertion</b>	<b>Action</b>
Styloglossus	Styloid process of the temporal bone	Whole length of the tongue	Pull the tongue upwards & backwards
Palatoglossus	Palatine aponeurosis	To the side of the tongue	Acting bilaterally, it narrows the oropharyngeal isthmus Raise the side of the tongue

### **INTRINSIC MUSCLES:**

- ❖ 4 groups
- ❖ Superior & inferior longitudinal
  - Located close to the dorsum of tongue
  - Shorten the length of the tongue and to curl the tip of the tongue & back
- ❖ Transverse muscles
  - Narrows the tongue
- ❖ Vertical muscles
  - Flattens the tongue

## **BLOOD SUPPLY OF TONGUE:**

### ***Arterial:***

- ❖ Lingual artery
- ❖ Tonsillar branch of facial artery
- ❖ Ascending pharyngeal artery

### ***Venous:***

- ❖ Lingual vein, drains into internal jugular vein
- ❖ Dorsal lingual vein, drains the tip and side of tongue and joins the lingual vein.

## **LYMPHATIC DRAINAGE OF TONGUE:**

- ❖ The anterior region of the tongue drains into the marginal and central vessels.
- ❖ The posterior part of the tongue drains into the dorsal lymph vessels.
- ❖ More central regions may drain both ipsilaterally and contralaterally, this has more clinical importance.
- ❖ Tip drains into submental nodes bilaterally and then to deep cervical nodes

- ❖ Anterior 2/3<sup>rd</sup> – lateral border - drains unilaterally into submandibular nodes
- ❖ Posterior 1/3<sup>rd</sup> drains into deep cervical nodes (jugulodigastric)

## **NERVE SUPPLY OF TONGUE:**

### ***SENSORY SUPPLY***

- ❖ Anterior 2/3<sup>rd</sup> – general sensation by lingual nerve and taste by chorda tympani of facial nerve through lingual nerve
- ❖ Posterior 1/3<sup>rd</sup> both general and taste sensation by glossopharyngeal nerve

### ***MOTOR SUPPLY:***

- ❖ Hypoglossal nerve supplies all tongue muscles except palatoglossus, which is supplied by vagus nerve.

## **PALATE:**

- ❖ The palate is divisible into two regions: the hard palate in front and soft palate behind.

### **HARD PALATE:**

- ❖ The palatine processes of the maxillae and the horizontal plates of the palatine bones forms the skeleton of the hard palate.

- ❖ The periphery of the hard palate surrounding the necks of the teeth is termed the gingiva.
- ❖ The palatine raphe is a zone lacking submucosa, runs anteroposteriorly in the midline as a narrow, low ridge.
- ❖ The upper nasal surface of the hard palate forms the floor of the nasal cavity and is covered by ciliated respiratory epithelium.
- ❖ The lower oral masticatory surface (roof of oral cavity) is covered by keratinized epithelium.

#### **SOFT PALATE:**

- ❖ The soft palate is a mobile flap which is suspended from the back of the hard palate.
- ❖ The boundary between the hard and soft palate may be distinguished by a change in colour, the soft palate being a darker red with a yellowish tint. A median conical process which projects downwards from its posterior border is called as uvula.

- ❖ The soft palate contains an aponeurosis, muscular tissue, vessels, nerves, lymphoid tissue and mucous glands, and some taste buds are situated on its oral aspect.

***Table:2 Muscles Of Soft Palate***

<b>Muscle</b>	<b>Origin</b>	<b>Insertion</b>	<b>Action</b>
Palatopharyngeus	Palatal aponeurosis	Lateral wall of the pharynx & posterior border of the thyroid cartilage	Elevates the pharynx & larynx Closes the oropharyngeal isthmus
Levator veli palatini	Medial aspect of the auditory tube	Directly into the palatine aponeurosis	Elevates the palate during swallowing, yawning
Tensor veli palatini	Lateral aspect of membranous part of auditory tube, scaphoid fossa of sphenoid bone	Tendon hooks around the hamulus & inserts into the palatal aponeurosis	Tenses the palate & opens the auditory tube during swallowing & yawning
Palatoglossus	Palatal aponeurosis	Dorsum of the lateral aspect of the tongue	Closes the oropharyngeal isthmus
Musculus uvulae	Posterior nasal spine	Uvula	Raises the uvula to help seal oral from nasopharynx

## **CHEEK:**

- ❖ The cheeks are covered externally by skin and internally by mucous membrane (buccal mucosa) and have a muscular skeleton, the buccinator.
- ❖ A slit like space lies between the lips or cheeks and the teeth called is the oral vestibule.
- ❖ A trough or sulcus is, formed when the mucosa covering the alveolus of the jaw is reflected onto the lips and cheeks, called the fornix vestibuli.

## **LIPS:**

- ❖ Like the cheeks, the lips are covered by skin externally and mucous membrane internally. Mucous membrane is smooth, shiny & shows small elevations due to underlying mucous glands.
- ❖ The orbicularis oris muscle forms the muscular skeleton of lips.
- ❖ The red zone of the lip (vermilion) is a feature characteristic of man

- ❖ In the upper lip, the vermilion protrudes externally in midline to form the tubercle, the grooved region present above the tubercle is called as philtrum.
- ❖ The lower lip shows a slight depression corresponding to the tubercle.

### **FLOOR OF MOUTH:**

- ❖ This comprises a small horseshoe-shaped region beneath the tongue.
- ❖ The mylohyoid muscle forms the muscular skeleton of floor.
- ❖ Near the base of the tongue, a fold of tissue seen extending onto the inferior surface of tongue in midline is called as lingual frenulum.
- ❖ Sublingual papillae, the central protuberance in the base of the tongue, wherein opens the submandibular salivary ducts.
- ❖ Submandibular ducts & sublingual glands present beneath the sublingual folds, located on either side of sublingual papillae.

## **BLOOD SUPPLY:**

### ***ARTERIAL:***

- ❖ The main arteries to the teeth, palate and cheeks are derived chiefly from the maxillary artery, a terminal branch of the external carotid
- ❖ The lips are mainly supplied by the superior and inferior labial branches of the facial artery.
- ❖ The cheek is supplied by the buccal branch of the maxillary artery.
- ❖ Upper jaw by anterior and posterior superior alveolar arteries, lower jaw by inferior alveolar artery (branch of maxillary artery)
- ❖ Anteriorly, the labial gingiva is supplied by the mental artery and by perforating branches of the incisive artery.
- ❖ The lingual gingiva is supplied by perforating branches from the inferior alveolar artery and by the lingual artery of the external carotid.
- ❖ Palate is supplied by greater and lesser palatine arteries.

### ***VENOUS:***

- ❖ The cheek is drained by the buccal vein that drains into the pterygoid venous plexus in the infratemporal fossa.
- ❖ Venous blood from the lips is collected by the superior and inferior labial veins and drains into the facial vein.
- ❖ The veins of the hard palate accompany the arteries and drain largely to the pterygoid plexus.

### **LYMPHATIC DRAINAGE:**

- ❖ The principal sites of drainage of lymphatic vessels from oral cavity are the submental, submandibular and jugulodigastric lymph nodes.
- ❖ The cheek, upper lip and lateral parts of the lower lip drain to the submandibular nodes.
- ❖ The central part of the lower lip drains to the submental nodes.
- ❖ The lingual gingivae and palate drain into jugulodigastric nodes either directly or indirectly through submandibular group.

## **NERVE SUPPLY:**

### ***SENSORY SUPPLY:***

- ❖ Cheek – buccal branch of mandibular nerve
- ❖ Upper lip – infraorbital nerve branch of maxillary nerve
- ❖ Lower lip – mental branch of the inferior alveolar nerve
- ❖ Palate - greater and lesser palatine and nasopalatine branches of the maxillary nerve (through pterygopalatine ganglion)
- ❖ Floor of mouth – lingual nerve
- ❖ Mucosa near the anterior pillars – branches from glossopharyngeal nerve
- ❖ Anterior, middle & posterior superior alveolar nerve supplies the upper alveolar margin; inferior alveolar nerve supplies lower alveolar margin.

### ***MOTOR SUPPLY:***

- ❖ All muscles of palate supplied by vagus nerve via pharyngeal branch to pharyngeal plexus
- ❖ Except tensor veli palatini – supplied by branch from mandibular nerve

- ❖ Secretomotor for palatal glands - supplied by superior salivatory nucleus through greater petrosal nerve.

**Table:3 TNM Clinical Classification For Lip And Oral Cavity**

<b>T – Primary</b>	
T1	Tumour 2 cm or less in greatest dimension & 5 mm or less depth of invasion
T2	Tumour 2cm or less in greatest dimension & more than 5 mm but no more than 10 mm depth of invasion or tumour more than 2 cm but no more than 4 cm in greatest dimension & depth of invasion no more than 10 mm
T3	Tumour more than 4 cm in greatest dimension or more than 10mm depth of invasion
T4a	Lip: tumour invades through cortical bone, inferior alveolar nerve, floor of mouth or skin (chin or nose)
T4a	Oral cavity: tumour invades through the cortical bone, into deep/extrinsic muscle of tongue, maxillary sinus or skin of face
T4b	Lip or oral cavity: tumour invades masticator space, pterygoid plates or skull base or encases internal carotid artery

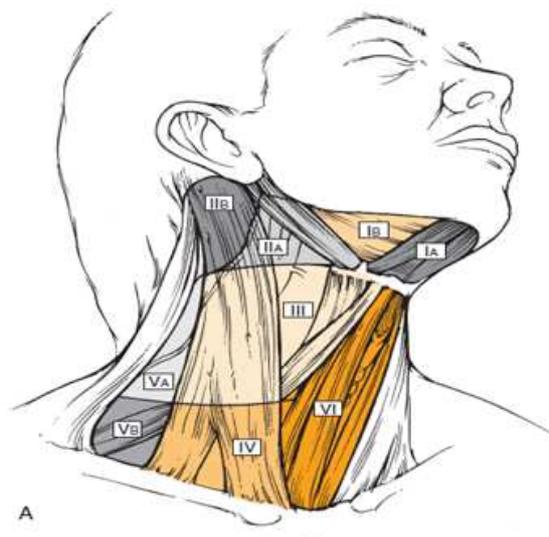
N	Regional lymph nodes
Nx	Regional lymph nodes cannot be assessed
N0	No regional lymph node metastasis
N1	Metastasis in a single ipsilateral lymph node, 3 cm or less in greatest dimension without extranodal extension
N2	N2a – Metastasis in a single ipsilateral lymph node, more than 3 cm but no more than 6 cm in greatest dimension without extranodal extension
	N2b – Metastasis in multiple ipsilateral lymph nodes, none more than 6 cm in greatest dimension, without extranodal extension

	N2c – Metastasis in bilateral or contralateral lymph nodes, none more than 6 cm in greatest dimension, without extranodal extension
N3a	Metastasis in a lymph node more than 6 cm in greatest dimension without extranodal extension
N3b	Metastases in a single or multiple lymph nodes with clinical extranodal extension

M – Distant metastasis	
Mx	Distant metastasis cannot be assessed
M0	No distant metastasis
M1	Distant metastasis

**LEVELS OF CERVICAL LYMPH NODES:**

*Fig:2*



*It is divided into 7 groups.*

1) Level I

- a. Level Ia – Submental group, drains anterior floor of mouth, lower lip and ventral tongue.

- b. Level Ib – Submandibular lymph nodes, drains lateral oral cavity structures such as the lateral tongue, floor of mouth and buccal cavity, which are closely related to the facial vessels.
- 2) Level II – Upper most nodes in jugular chain, from skull base to inferior border of hyoid bone; drains oropharynx, oral cavity, nasopharynx, hypopharynx and larynx.
  - a. Level IIa – Caudal to spinal accessory nerve.
  - b. Level IIb – Cranial to spinal accessory nerve.
- 3) Level III
  - a. Middle jugular chain nodes, from inferior border of hyoid to inferior aspect of cricoid cartilage; drains lower areas of oropharynx, hypopharynx and larynx
- 4) Level IV
  - a. Lower jugular lymph nodes, from inferior aspect of cricoid cartilage to clavicle, drains hypopharynx and larynx
- 5) Level V

- a. Posterior triangle group of lymph nodes, divided by an imaginary horizontal line at the level of the inferior border of cricoid cartilage
  - b. Level Va – above the imaginary line, contains lymph nodes related to spinal accessory nerve
  - c. Level Vb – below the imaginary line, contains lymph nodes related to transverse cervical artery and the supraclavicular lymph nodes.
- 6) Level VI
- a. Midline group of lymph nodes, bounded by common carotids laterally, superiorly by inferior border of hyoid bone and inferior boundary is the innominate artery on the right side of the neck and the corresponding level on the left side. The paratracheal, perithyroid and precricoid (Delphian) nodes are in this zone.
- 7) Level VII
- a. Lymph nodes of superior mediastinum, these lymph nodes may harbour metastasis from thyroid, subglottic or tracheal or cervical oesophageal malignancies.

## **SURGICAL IMAGES**

**FIG:3 SUB PLATYSMAL FLAP ELEVATION**



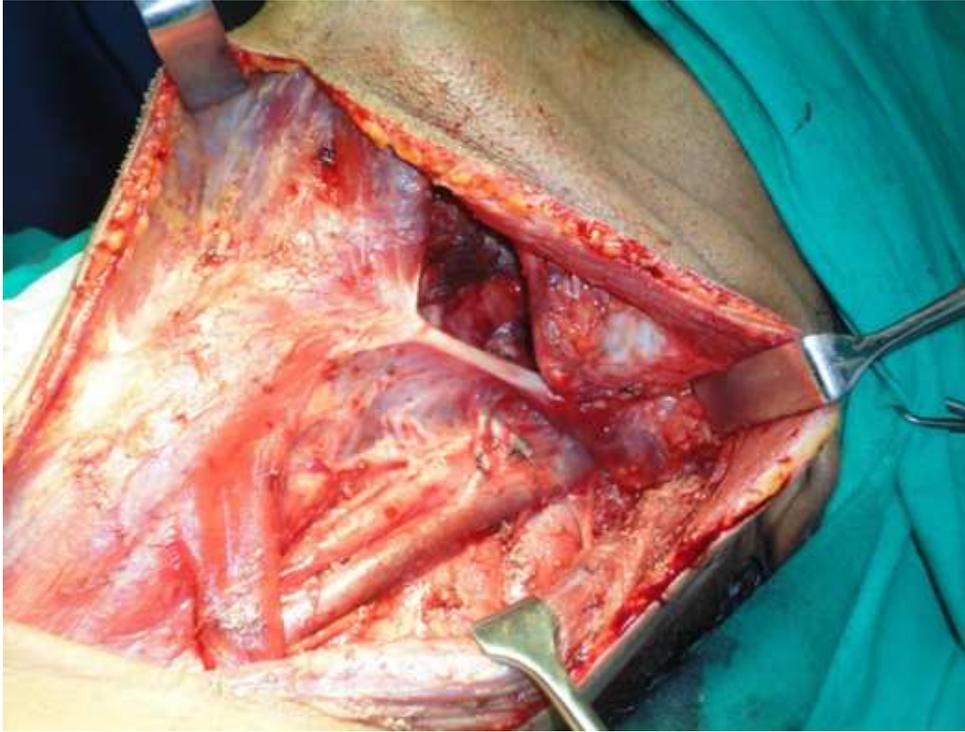
**FIG:4 REMOVAL OF LEVEL IA AND I B**



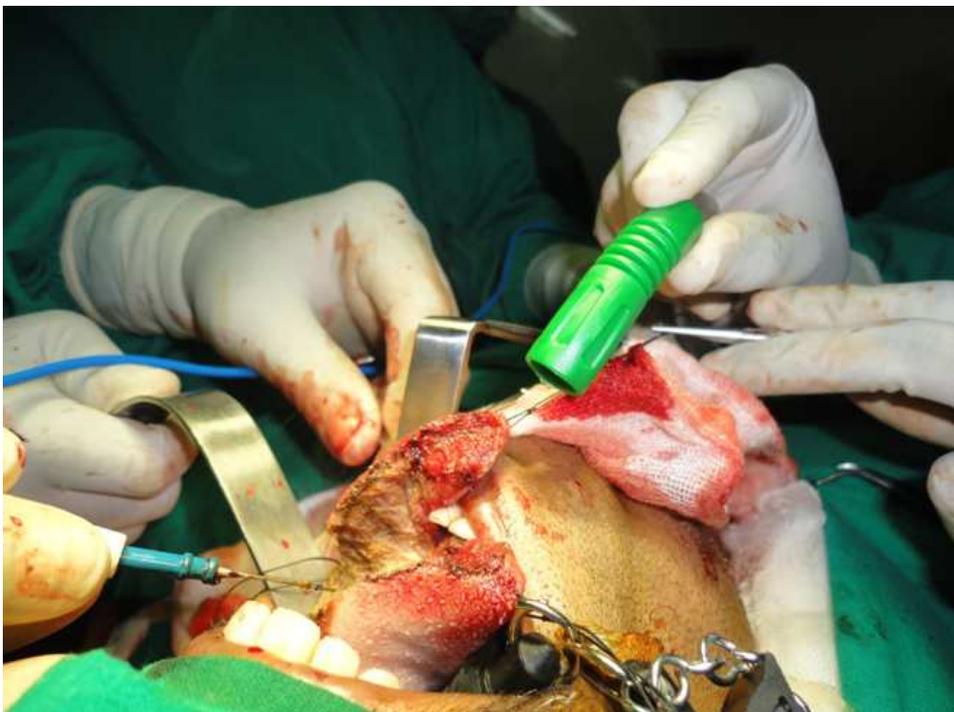
**FIG:5 REMOVAL OF LEVEL IIA, II B AND III & IV**



**FIG:6 NECK DISSECTION COMPLETION**



**FIG:6A HEMIGLOSSECTOMY**



## **REVIEW OF LITERATURE**

Oral cancer has a long preclinical phase that consists of well documented precancerous lesions. Pre-cancer lesions are Leukoplakia, Erythroplakia, oral submucosal fibrosis, and Lichen planus. Malignant transformation range from 0.13 to 2.2%.

Early stage localized low grade oral cancers can be effectively treated and cured with surgery or radiotherapy alone resulting in five year survival rates exceeding 80%

Oral cavity tumors are treated by single modality treatment either definite radiotherapy or surgery alone or combined with adjuvant radiotherapy.

Surgery depends on the site of primary which consists of wide excision with 1cm margins from the tumor. Reconstructive options available based on the defect, from primary closure to microvascular free flap

Radiotherapy options are external beam radiotherapy or interstitial brachytherapy. Osteoradionecrosis and mucositis are severe complications of radiotherapy.

## CERVICAL NODAL METASTASIS

Cervical lymph node metastasis is a very significant prognostic indicator in patients with head and neck cancers, decreasing survival by approximately 50%

Cervical lymph nodes can occur at early-stage of SCC due to the fact that lymphoid tissue in head and neck region, especially the oral cavity, functions as a network.

25-46% of occult lymphatic metastasis in early-stage SCC of oral cavity has been reported.

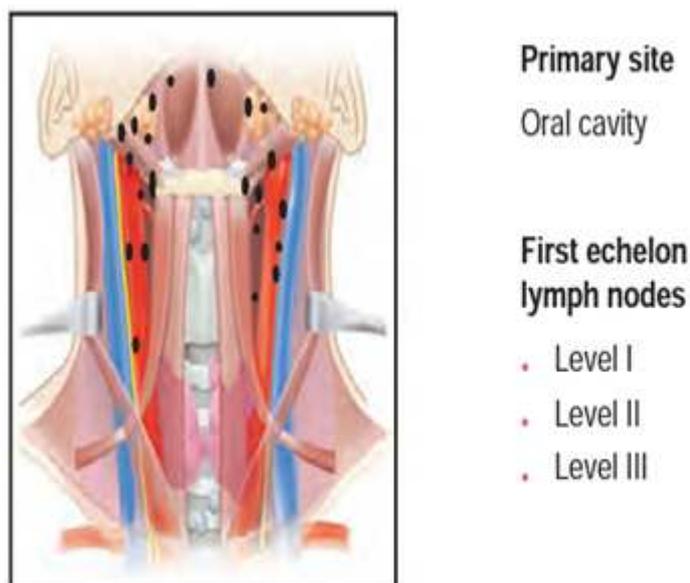


Fig:7

The lymph nodes at highest risk of occult metastases from oral cavity cancers are those at levels I, II, and III. The metastatic

rates to these sites are 58% (level I), 51% (level II), 26% (level III), 9% (level IV), and 2% (level V).

However, it is difficult to make a definite diagnosis to occult lymphatic metastasis due to low sensitivity (75%) and a specificity (81%) of clinical examination on the affected lymph nodes.

Although there are many modern imaging technologies including ultrasonography, computed tomography (CT), magnetic resonance imaging (MRI), and positron emission tomography CT (PET-CT), however the sensitivity in detecting such occult metastasis of cervical lymph node is not satisfying.

## **PROGNOSTIC FACTORS IN ORAL CAVITY CANCERS**

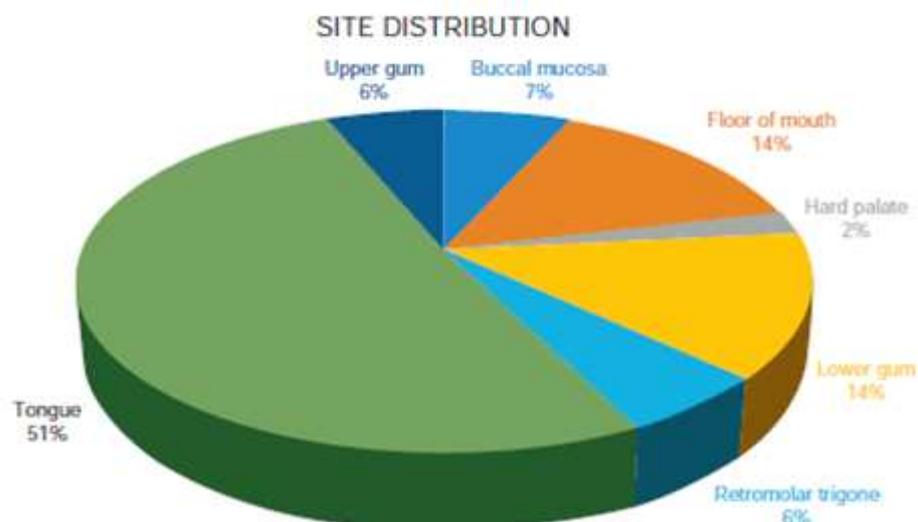


Fig:8

## **TUMOR SIZE**

Advanced T stage is generally associated with greater incidence of subclinical cervical nodal metastasis

**Tytor et al<sup>[1]</sup>** reported that incidence of occult nodal metastasis in T1 & T2 tumors are 14% and 37% respectively, However not all author found similar correlation

**Haksever M et al<sup>[2]</sup>** reported that prevalence of nodal metastasis in patients with T1/T2 was 51.5% and T3/T4 was 58.8% respectively, this study stated that tumor size which is most important component of TNM system was not significantly associated with neck node involvement

**Byer's et al<sup>[3]</sup>** did not find any correlation in their study between tumor size and nodal metastasis

## **TUMOR THICKNESS**

Tumor thickness is consider to be an important factor in predicting the cervical nodal metastasis

**P O Charoenrat et al<sup>[4]</sup>** indicates that the thickness of primary tumor has a strong predictive value for occult cervical metastasis when the tumor thickness is >5mm significant predictive value in stage I/II oral squamous cell carcinoma

**Fukuno et al<sup>[5]</sup>** in their study stated that incidence of occult metastasis for tumor thickness upto 5mm is 5.9% and that of >5mm is 64.7%.

**Brown et al<sup>[6]</sup>** in their study stated that incidence was 38% for tumor thickness upto 3mm ,and that of 41% for thickness upto 3-7mm and that of 55% for >7mm.

**O Brein et al<sup>[7]</sup>** found that cut off for occult node positivity is 4mm and Elective neck dissection has to be done if tumor thickness more than 4mm.

## **PERINEURAL INVASION AND LYMPHATIC VASCULAR INVASION**

Perineural invasion and Lymphovascular invasion has been associated with decreased survival and increased local recurrence necessitating more aggressive therapy.

**Brown et al<sup>[6]</sup>**found that cervical node metastasis developed in 71% of N0 patients who had perineural invasion, showed that in the presence of perineural invasion 2-year survival decreased from 82% to 52%.

**Lydiatt et al<sup>[8]</sup>**, documented stage I and II tongue cancer, found that local control rate at 5 years was 38% in patients with

perineural invasion, versus 78% in patients without perineural invasion.

**Jardim et al<sup>[9]</sup>** showed in their study had 40.8% positive Lymphovascular invasion and among the positive nodal metastasis 50.5% had positive lympho vascular invasion

**Brown et al<sup>[6]</sup>** reported that angiolymphatic invasion also as a predictor of occult metastases with 85% of neck nodal disease, In its presence as there as 38% in its absence.

## **TUMOR GROWTH PATTERN**



Fig:9

Infiltrating or Ulcerative tumor growth pattern have high incidence of occult nodal metastasis.

There is no single prognostic factor to address the occult nodal metastasis. Multivariate factors are there to predict the occult nodal metastasis in early oral cavity cancer.

**Sparano et al<sup>[10]</sup>** Multivariate model for occult metastasis includes

- 1) Tumor thickness
- 2) Perineural invasion
- 3) Infiltrating invasion
- 4) Poor differentiation
- 5) T2 stage

**Hiratsukah et al<sup>[11]</sup>** stated that most significant predictors for occult nodal metastasis of clinical and histological factors are

- 1) Mode of carcinoma invasion
- 2) Intensity of lymphocytic infiltration
- 3) Degree of differentiation
- 4) Number of mitotic figures

Scoring system to predict the risk and management of oral squamous cell carcinoma are

**Broders classification**<sup>[12]</sup>, accordingly tumors were graded on the basis of degree of differentiation and keratinization

- ❖ Grade 1 - Well differentiated tumor
- ❖ Grade 2 - Moderate differentiated tumor
- ❖ Grade 3 - Poorly differentiated tumor
- ❖ Grade 4 – Anaplastic tumor

**Anneroth et al** <sup>[13]</sup> proposed histopathologic grading system based on morphological features

- ❖ Degree of keratinization
- ❖ Nuclear polymorphism
- ❖ Number of mitosis
- ❖ Pattern of invasion
- ❖ Lymphoplasmacytic infiltration

Stage of invasion each scored from 1-4, then the sum of scores grouped as follows

- ❖ Grade I 6-12
- ❖ Grade II 13-18
- ❖ Grade III 19-24

**Bryne's et al<sup>[14]</sup> deep invasive cell grading system**

According to this system , number of mitosis and stage of invasion was omitted from anneroth grading, sum of scores grouped as follows

- ❖ Grade I 4-8
- ❖ Grade II 9-12
- ❖ Grade III 13-16

***Table:4 Martinez Gemino Grading System<sup>[15]</sup>***

<b>Parameters</b>	<b>Subtypes</b>	<b>Score</b>
Intravascular invasion	Negative	1
	Positive	7
T Category	1	1
	2	3
	3	3
	4	5
Grade of differentiation	Good	1
	Moderate	3
	Poor	5
Tumor thickness	≤3 mm	1
	3-7 mm	3
	>7mm	5
Tumor interphase	Uniform front	1
	Other	3
Inflammatory infiltration	Moderate-high	1
	Zero-light	3
Perineual spread	Negative	1
	Positive	2

## **BRANDWEIN GENSLER HISTOLOGICAL RISK ASSESSMENT :**

The variables are:

- ❖ Worst pattern of invasion (WPOI)
- ❖ Predominant pattern of invasion (PPOI)
- ❖ Grade
- ❖ Multifocal carcinoma in situ
- ❖ Keratin
- ❖ Foreign body reaction
- ❖ Eosinophilia
- ❖ Lymphocytic infiltrate
- ❖ Vascular/lymphatic invasion
- ❖ Perineural invasion

## **NECK EVALUATION**

Pretreatment neck evaluation is important to decide on indication and extent of treatment.

- 1) Clinical palpation
- 2) Ultrasound neck
- 3) CT scan
- 4) PET CT

5) Sentinel node biopsy

Imaging of lymph node metastasis in neck has two major indication

1) Prognosis and assessing with choice of treatment

2) Staging and detection of occult metastasis

Other important prognostic factors are

1) Amount of necrosis

2) Tumor volume

3) Extra nodal extension

**Vanden breckel MV<sup>[16]</sup>** proposed that sensitivity and specificity of Clinical palpation of neck node is 60-70%

**Merritt et al<sup>[17]</sup>**, did a systematic review of studies comparing palpation with computed tomography (ct),

This study found a sensitivity of 75% and 83% and a specificity of 81% and 83% for palpation and ct, respectively

**Giancarlo et al<sup>[18]</sup>** Comparing palpation with ultrasonography (US) found no differences between the methods, and palpation had a sensitivity of only 82% and specificity of 80%

**Akoglu et al**<sup>[19]</sup> found a sensitivity of palpation of 59.2% and a specificity of 93%, widely surpassed by operative characteristics of CT (sensitivity 78%, specificity 80%) and US (sensitivity 80%, specificity 59%).

**Haberal et al**<sup>[20]</sup> found a sensitivity of 64%, 72% and 81% and a specificity of 85%, 96% and 96%, for palpation, US and CT.

**Schoder et al**<sup>[21]</sup> , did a study on patients With oral cavity tumors, thereby assessing 36 necks, classified N0 by palpation and with negative CT and magnetic resonance imaging (MR I), PET-CT showed a sensitivity of 67% and specificity of 85%, which offer no advantages, as staging tools, in N0 patients. Other imaging methods such as US and computerized tomography showed a sensitivity of 72% and 81% and specificity of 96% and 95%, respectively.

**Stuckensen et al**<sup>[22]</sup> studying 106 patients found a sensitivity of 70%, 84% and 66% and a specificity of 82%, 68% and 74% for PET, US and CT, respectively

At this point it is clear that clinical and imaging studies are not sufficiently sensitive to modify the indication of elective neck dissection.

## **TREATMENT OPTIONS AVAILABLE FOR CLINICALLY NODE NEGATIVE NECK :**

- 1) Observation
- 2) Elective neck irradiation
- 3) Elective neck dissection

## **ELECTIVE NECK DISSECTION VERSUS OBSERVATION**

**Weiss et al**<sup>[23]</sup> Concluded that observation is the preferred option when the probability of Occult metastasis is less than 20% and elective neck treatment (irradiation or Dissection) is preferred if the probability of occult metastasis is greater than 20%.

**Kligerman et al**<sup>[24]</sup> had shown that in early carcinoma of

The oral cavity the addition of a SOHND increased 3-year survival from 49% to 72%.

**Sara abu-ghanem et al**<sup>[25]</sup>, found that regional nodal recurrence was detected in none to 30.0% of the patients in the end group compared with 5.7% to 57.5% of the patients in the observation group

## **ELECTIVE NECK IRRADIATION**

**Mendenhall et al**<sup>[26]</sup> showed that elective neck irradiation (ENI) reduced the neck failure rate in patients with controlled primary tumors and N0 necks from 18% to 1.9%. The dose of radiation varied from 50

Gy to 75 Gy in the upper neck and from 40 Gy to 50 Gy in the lower neck. Another study reported that ENI provided a 95% control rate for neck recurrences compared with 38% without ENI in T1 N0 squamous cell carcinoma of the Oral tongue. Hence, the neck recurrence rate can be extrapolated to be 5%, which is comparable to the 4% to 7% recurrence rate noted in elective neck dissection.

**Al-Rajhi et al**<sup>[27]</sup> demonstrated that the rate of neck recurrence in patients who were observed was 35%, in patients who received ENI was 39%, and in patients who received END was 19%. These investigators concluded that END is the modality of choice for treatment of the N0 neck. They used ENI with a total dose of 45 to 50 Gy, however, and showed no survival difference among the three groups.

**Chow et al**<sup>[28]</sup> demonstrated that after 5-year follow-up there was no statistical difference between ENI and END in regard to neck recurrence for cancers of the oral cavity, oropharynx, and larynx

## **ELECTIVE NECK DISSECTION**

### **ADVANTAGES OF ELECTIVE NECK DISSECTION**

- 1) ENI provides pathologic information on the status of the neck nodes, thus helping to determine the need for additional therapy.

- 2) It can also remove undetectable cancer cells lodged in the Lymph vessels and nodes (micro-metastasis)
- 3) High incidence of occult nodal metastasis
- 4) It is very difficult to follow up
- 5) During observation N0 neck to become N+ may lead to local and regional progression of disease
- 6) Information obtained by pathologic analysis of neck dissection specimen will identify high risk patients and help in further prognostication and incorporation adjuvant treatment.

**Anil D cruz et al<sup>[29]</sup>** did a study conducted for Elective neck dissection versus therapeutic neck dissection. The study concluded that elective neck dissection at the time of resection Of the primary tumor confers an overall survival Benefit in patients with early-stage, clinically Node-negative oral squamous-cell carcinoma

**Shah JP et al<sup>[30]</sup>** found neck levels I, II, and III to be at greatest risk of nodal metastases from primary squamous cell carcinoma of the oral cavity. Indicated supraomohyoid neck dissection for N0 neck

**Dias et al**<sup>[31]</sup> found that patients who underwent elective neck dissection had a 23% higher disease-free survival rate compared with those who underwent resection of the tumor alone. Elective neck dissection significantly improved regional control of the disease.

**Ding Z et al**<sup>[32]</sup> concluded in their study that END substantially decreases recurrences and deaths related to regional recurrences in early-stage SCC of the oral cavity with clinically N0 neck, especially SCC of the oral tongue and floor of the mouth.

**Fakih et al**<sup>[33]</sup> reported patients with oral Tongue tumors thereby demonstrating a better overall and disease free survival for the group of elective neck dissection. As important data, they found that benefits of elective neck dissection were more evident in patients with tumours deeper than 4 mm.

**Kligerman et al**<sup>[24]</sup>. Found a recurrence rate of 42% in the group of observation *vs.* 24% in the group of elective neck dissection and a 3.5-year disease-free survival rate of 49% *vs.* 72%, respectively.

**Kowalki et al**<sup>[34]</sup> found The evidence available suggests a protective effect of elective neck dissection for patients with oral cancer.

**Sara Abu-Ghanem et al<sup>[25]</sup>** indicate that END can significantly reduce the rate of regional recurrence and improve DSS of patients with ct1t2n0 OTSCC.

**Byers et al<sup>[35]</sup>** concluded in their report that all patients with Stage T2–T4 N0 squamous cell cancer of the oral tongue should undergo elective dissection of the neck. Patients with T1N0 cancer who have a double DNA-aneuploid tumor, depth of muscle invasion greater than 4 mm, or poorly differentiated cancer should definitely undergo elective neck dissection.

Results from these studies, classified as the best available evidence, suggest that **ELECTIVE NECK DISSECTION** offers advantages in terms of overall, cancer specific and disease free survival.

Elective neck dissection useful for pathological staging and therapeutic. On pathological examination following are observed

- ❖ Level of node
- ❖ Number of nodes
- ❖ Perineural and lymphovascular spread
- ❖ Extranodal extension

Presence of extra nodal extension is very important prognostic factor for recurrence

The lymph nodes at highest risk of occult metastases from oral cavity cancers are those at levels I, II, and III . The metastatic rates to these sites are 58% (level I), 51% (level II), 26% (level III), 9% (level IV), and 2% (level V).

**Byers et al**<sup>[35]</sup> noted a skip metastasis rate of 15% to level IV in squamous cell carcinoma of the oral tongue and advocated that dissection of level IV should be included in a selective neck dissection. More recently it has been demonstrated that level IV need be dissected only if there are suspicious nodes in level II or III.

## **ELECTIVE VERSUS THERAPEUTIC NECK DISSECTION**

Patients are usually treated with oral surgical excision of the primary tumor. Surgical options for addressing the neck include elective neck dissection at the time of the excision of the primary tumor or watchful waiting with therapeutic neck dissection for nodal relapse. Proponents of elective neck dissection cite decreased relapse rates and better survival rates.

**Anil k. D’cruz**<sup>[29]</sup> elective versus therapeutic neck dissection in node-negative oral cancer elective node dissection resulted in an improved rate of overall survival (80.0%; 95% confidence interval [ci], 74.1 to 85.8), as compared with therapeutic dissection (67.5%; 95% ci, 61.0 to 73.9), elective node dissection was superior in most subgroups without significant interactions. Concluded among patients with early-stage oral squamous-cell cancer, elective neck dissection offers higher rates of overall and disease-free survival than did therapeutic neck dissection.

#### **CONTRALATERAL NECK IN N0**

Another issue of concern is the treatment of the contralateral N0 neck. A study showed that there was a 14% incidence of involvement of contralateral neck nodes regardless of tumor stage. The Head and Neck Society recommends the treatment of the contralateral nodes if the primary oral cavity cancer is midline, bilateral, along the tip of the tongue, or approaches or crosses the midline.

## **MATERIALS AND METHODS**

### **STUDY DESIGN**

Prospective Study

### **STUDY SETTING**

The study was conducted at Upgraded Institute of Otorhinolaryngology, Rajiv Gandhi Government General Hospital, Chennai – 600003

### **PERIOD**

The study was conducted from period October 2018 to May 2019.

### **METHOD**

Primary curative surgery according to the site of lesion and Selective Neck Dissection is done for all the patients. Primary tumor and Neck nodes separately classified and sent for histopathological examination and observed for occult positivity and observation of following criteria,

- 1) Percentage of occult nodal metastasis
- 2) Which group of node involved commonly
- 3) Specific involvement of Level 2B node

- 4) Site of primary in relation to nodal metastasis

**MATERIAL:**

Patients attending UIORL and Surgical oncology OPD to meet inclusion and exclusion criteria operable oral cavity and all cases undergoing Primary curative surgery according to the site of lesion and Supraomohyoid Neck Dissection including Level I,II,III and IV. Department of UIORL and Surgical Oncology, RGGGH & MMC from October 2018 to May 2019 all patients followed upto the period of 6months to 3yrs and results were analysed.

**INCLUSION CRITERIA:**

All patients with histologically proven T (any operable T stage) N0 M0 (clinical) squamous cell carcinoma of the oral cavity

- 1) Planned modality is curative surgical treatment
- 2) Neck node status is N0
- 3) No history of a prior malignancy in the head and neck region.
- 4) Age >30<60
- 5) Understands the protocol and is able to give informed consent.

### **EXCLUSION CRITERIA:**

- 1) Nonsquamous cell carcinomas of the oral cavity.
- 2) Radio recurrent and Radio residual growth
- 3) Prior radiotherapy or surgery for malignancy in the head and neck region.

### **INVESTIGATION**

- 1) USG of Neck
- 2) CT scan of the neck-with contrast
- 3) Biopsy of the primary lesion
- 4) Biopsy of the surgical specimen – primary and neck node

## RESULTS

Statistical analysis is done through Statistical Program for Social Sciences (SPSS 20) software. Descriptive statistical analysis was done to summarize the baseline characteristic results. Mean, median and standard deviation has been calculated in descriptive statistics. Pearson chi- square was used to assess statistically significant parameters.

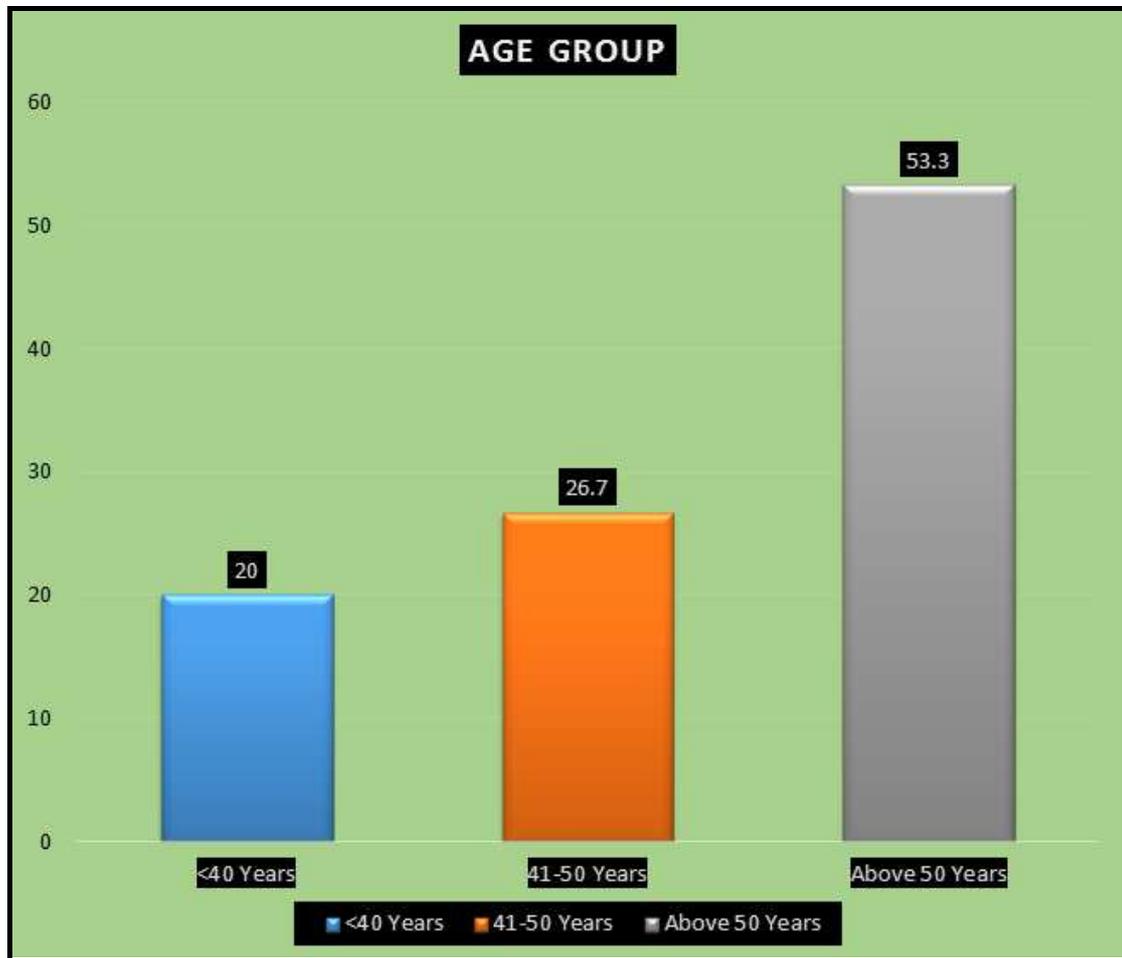
### AGE GROUP WISE DISTRIBUTION

*Table 5: Percentage distribution of the study population by age group.*

<b>AGEGROUP</b>	<b>Frequency</b>	<b>Percent</b>
<40 Years	6	20.0
41-50 Years	8	26.7
Above 50 Years	16	53.3
Total	30	100.0

Among the study group majority of patients were above 50yrs.the mean age was 49yrs

*Fig: 10 Bar diagram showing distribution by age group*



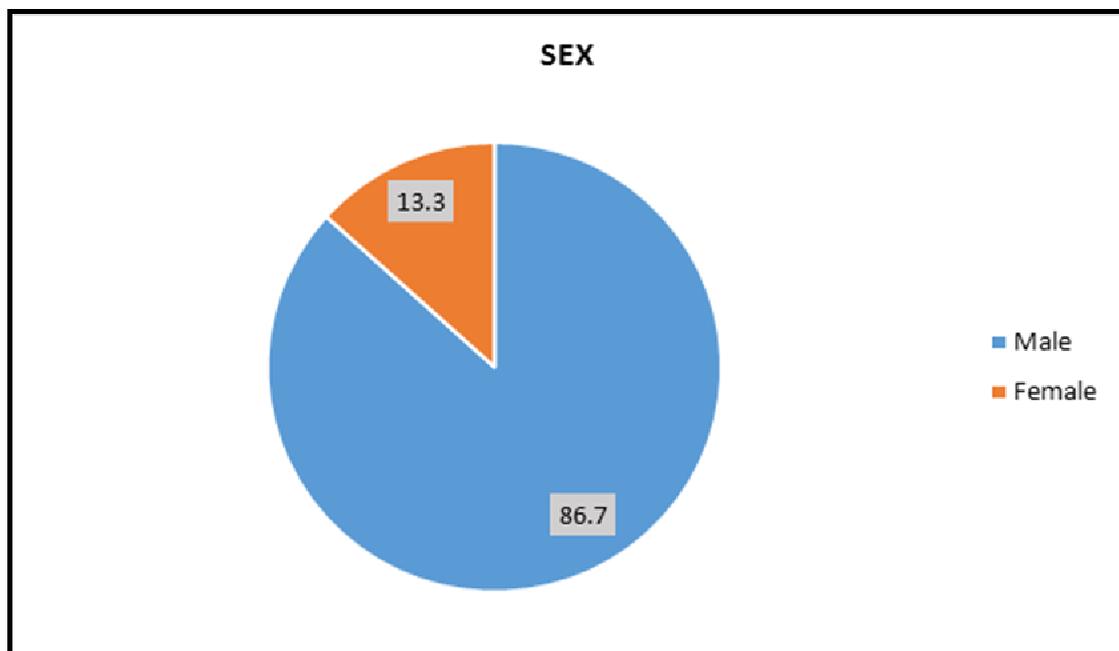
## SEX DISTRIBUTION

*Table 6 : Percentage distribution of study population by sex*

SEX	Frequency	Percent
Male	26	86.7
Female	4	13.3
Total	30	100.0

Regarding sex distribution of participants, the males were 87% and females were 13.3%

*Fig:11 Pie chart showing sex distribution of participants*

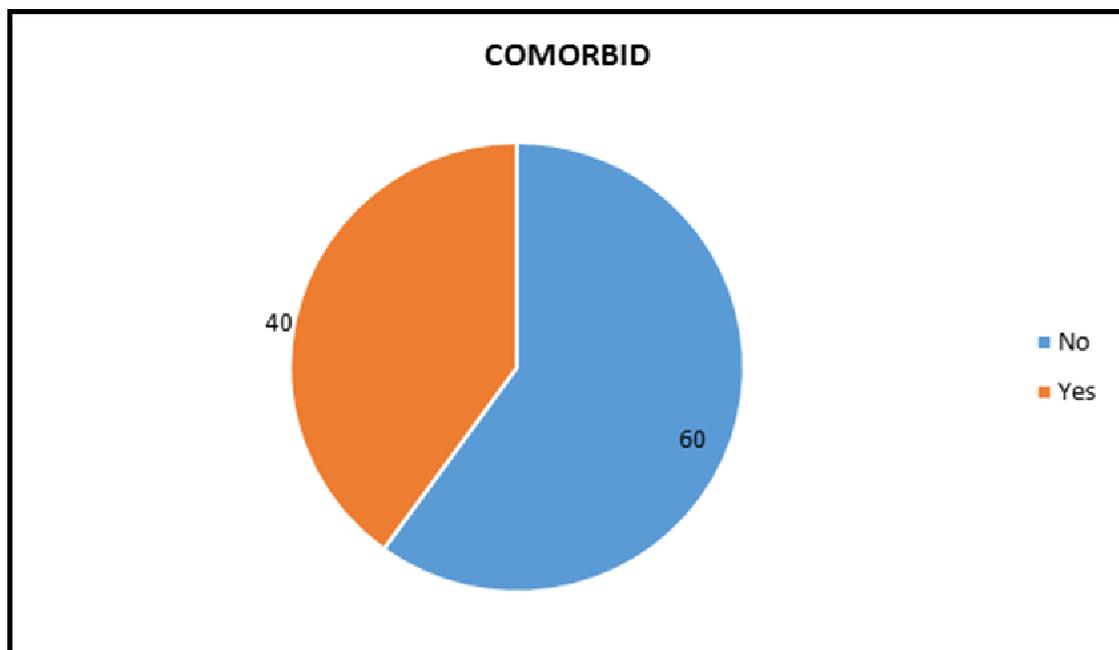


**Table 7: Percentage distribution of comorbidities in study population**

<b>COMORBID</b>	<b>Frequency</b>	<b>Percent</b>
No	18	60
Yes	12	40
Total	30	100

Among the patients studied comorbid conditions were found in 40% of patients.

**Fig :12 Pie chart showing distribution in study population with comorbidities**

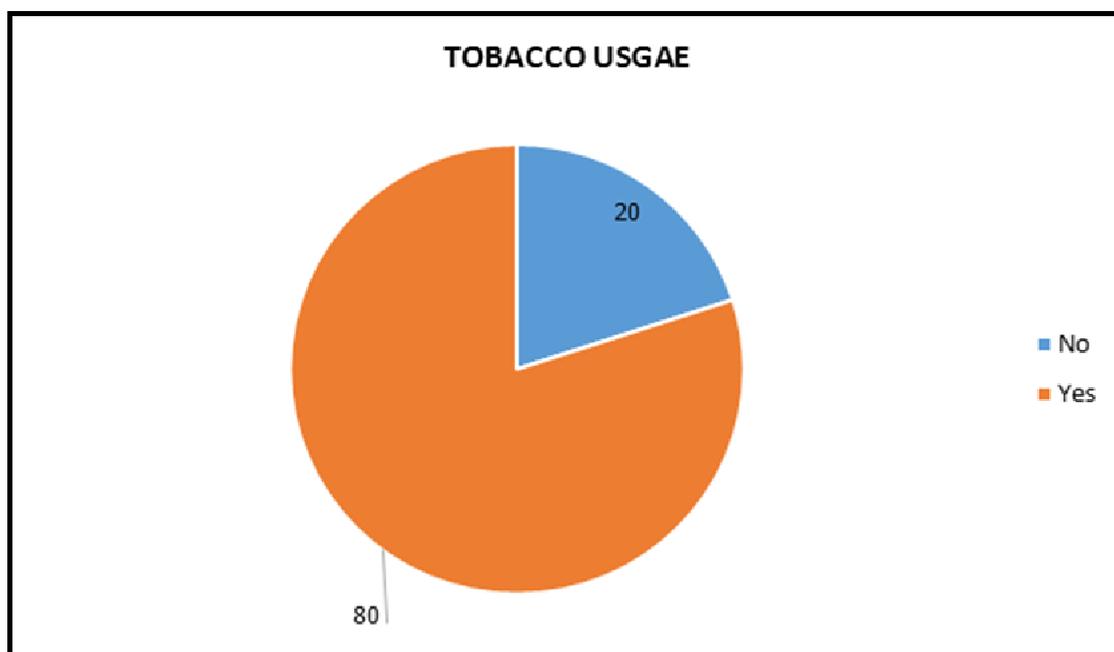


**Table 8: Percentage of distribution by tobacco usage among study population**

<b>TOBACCO USGAE</b>	<b>Frequency</b>	<b>Percent</b>
No	6	20.0
Yes	24	80.0
Total	30	100.0

In this study tobacco usage was found in 80 percent of patients, only 20 % of patients no using tobacco developed cancer

**Fig 13 : Pie chart showing percentage of distribution by tobacco usage**

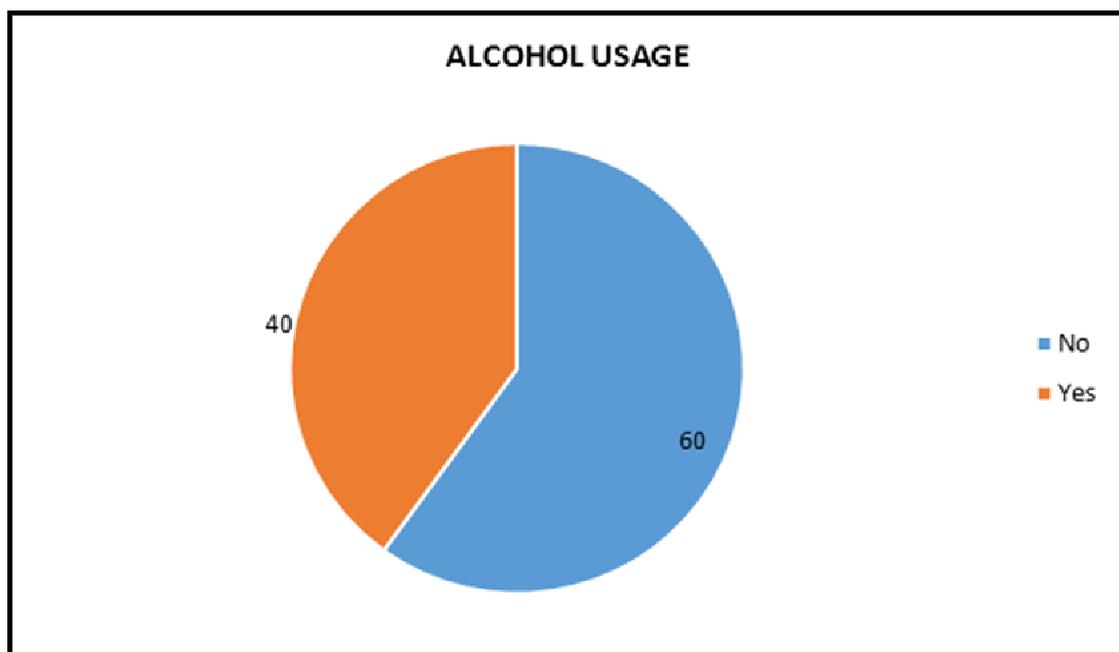


**Table 9: Percentage distribution of study population by alcohol usage**

<b>ALCOHOLUSAGE</b>	<b>Frequency</b>	<b>Percent</b>
No	18	60.0
Yes	12	40.0
Total	30	100.0

In this study alcohol usage was found in 40% of patients

**Fig14: Pie chart showing % distribution by alcohol usage**

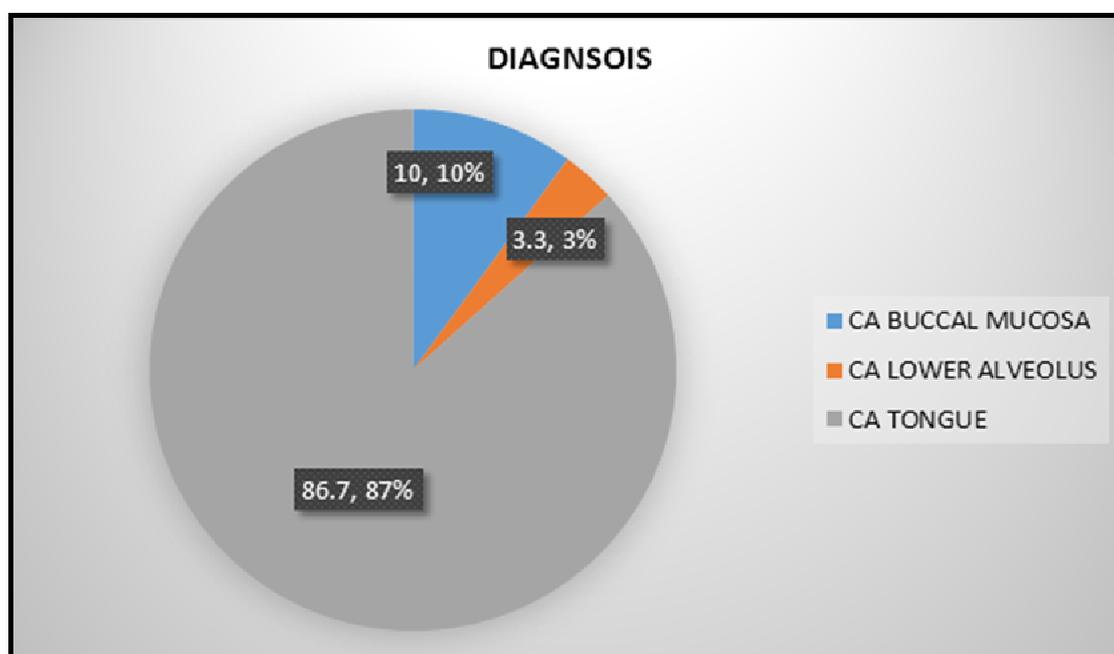


**Table 10: Percentage of distribution based on site of lesion among study population**

DIAGNOSIS	FREQUENCY	PERCENT
CA Buccal mucosa	3	10.0
CA Lower alveolus	1	3.3
CA Tongue	26	86.7
Total	30	100.0

In Majority of patients the site of primary was Oral tongue around 87% , buccal mucosal 10% and lower alveolus 3%

**Fig 15 : Pie chart showing distribution by site of lesion**

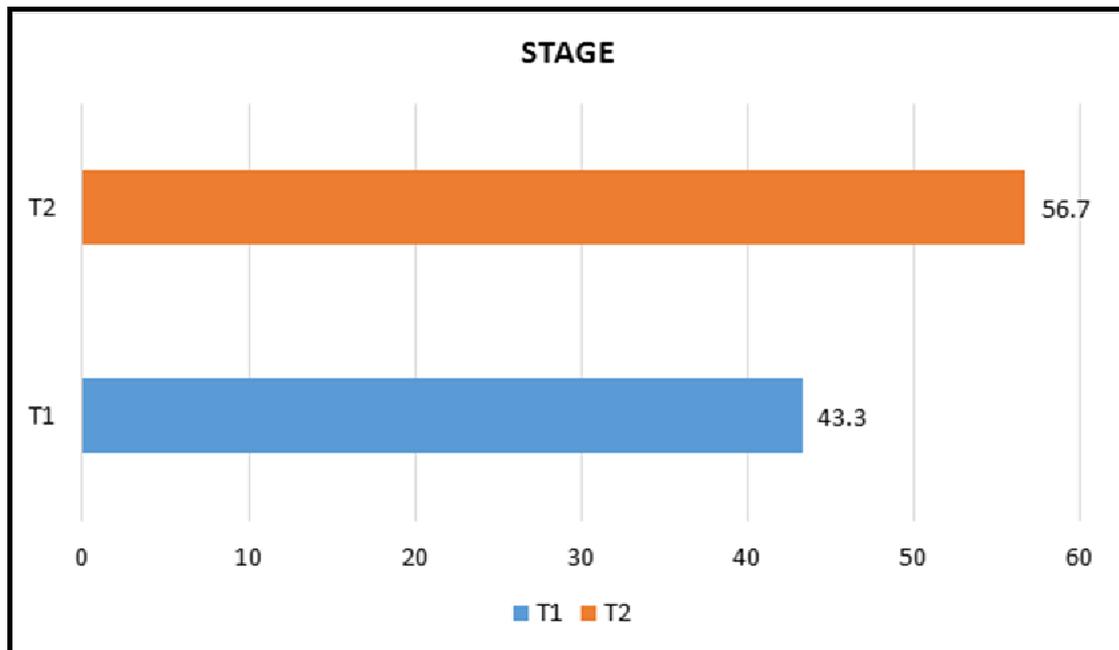


**Table 11 : Percentage of distribution by tumor staging in study population**

STAGE	FREQUENCY	PERCENT
T1	13	43.3
T2	17	56.7
T3	0	0
T4	0	0
Total	30	100.0

Almost all cases diagnosed with T1 and T2 stage. Among tumor staging T1 was 43% and T2 was 57%

**Fig 16: Bar diagram showing percentage distribution by tumor staging**



**Broders classification**<sup>[12]</sup>, accordingly tumors were graded on the basis of degree of differentiation and keratinization

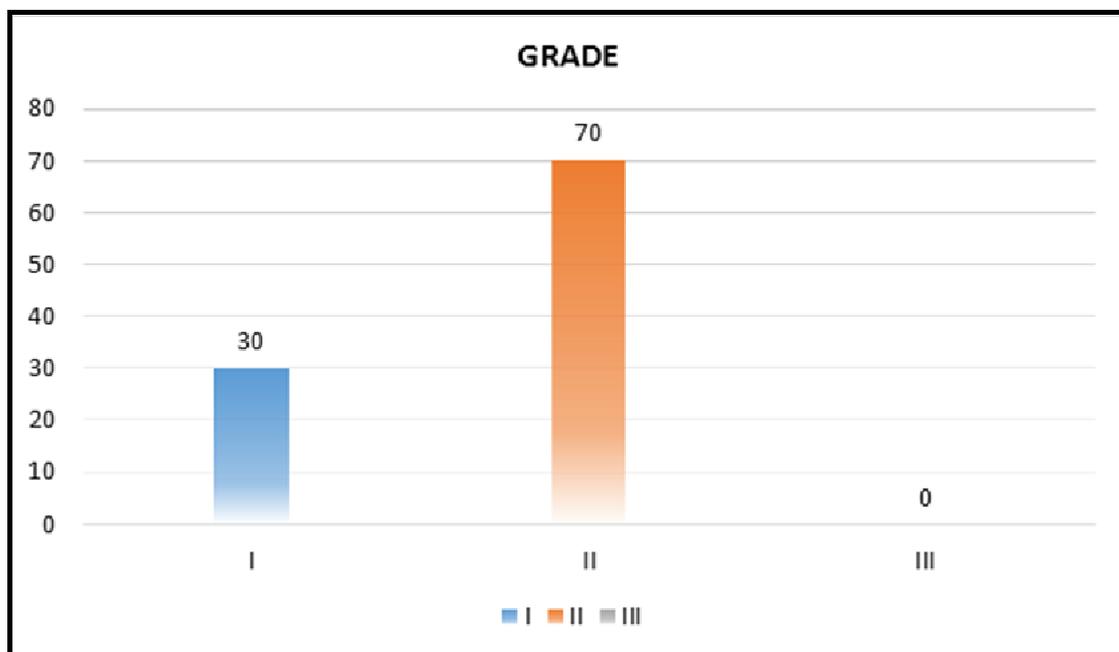
- ❖ Grade 1 - Well differentiated tumor
- ❖ Grade 2 - Moderate differentiated tumor
- ❖ Grade 3 - Poorly differentiated tumor
- ❖ Grade 4 – Anaplastic tumor

**Table 12: Percentage distribution of study population by tumor grading**

<b>GRADE</b>	<b>Frequency</b>	<b>Percent</b>
I	9	30.0
II	21	70.0
III	0	0
Total	30	100.0

Grade of the tumor in most patients were moderately differentiated 70% and well differentiated tumors are 30%. In our study no poorly differentiated tumor was documented

**Fig 17: Bar diagram showing distribution by tumor grading among study population**

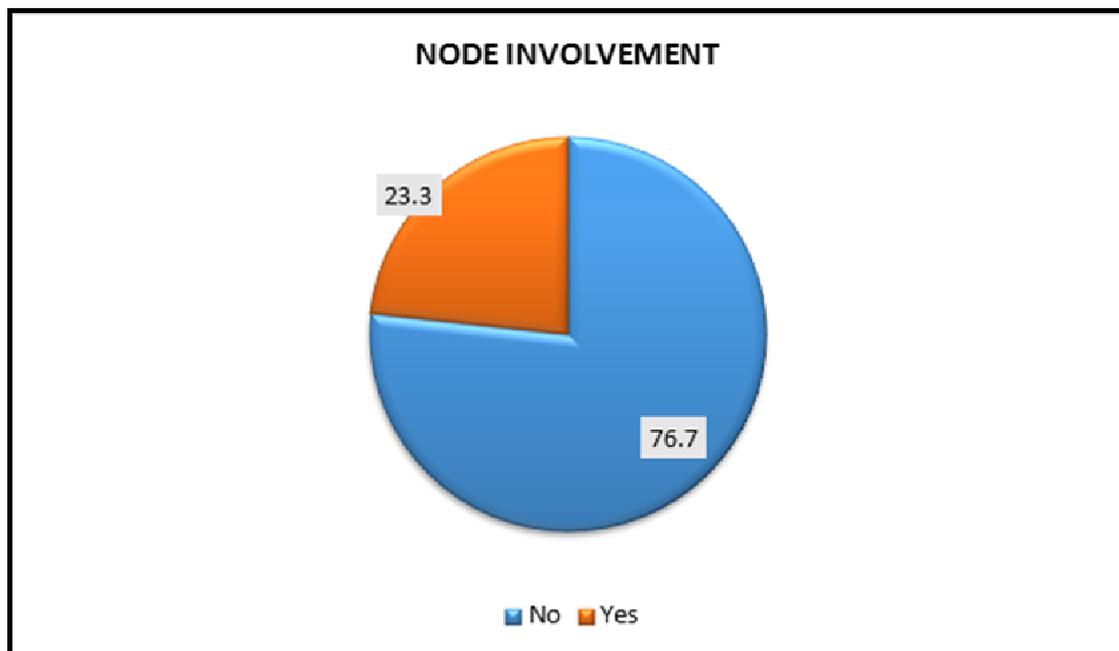


**Table 13 : Percentage of distribution of study population by node involvement**

<b>NODE INVOLVEMENT</b>	<b>Frequency</b>	<b>Percent</b>
No	23	76.7
Yes	7	23.3
Total	30	100.0

Among the patients studied 7 out of 30 patients have occult cervical nodal metastasis. Incidence is 23.3%.

**Fig 18: Pie chart showing Percentage of distribution of study population by node involvement**

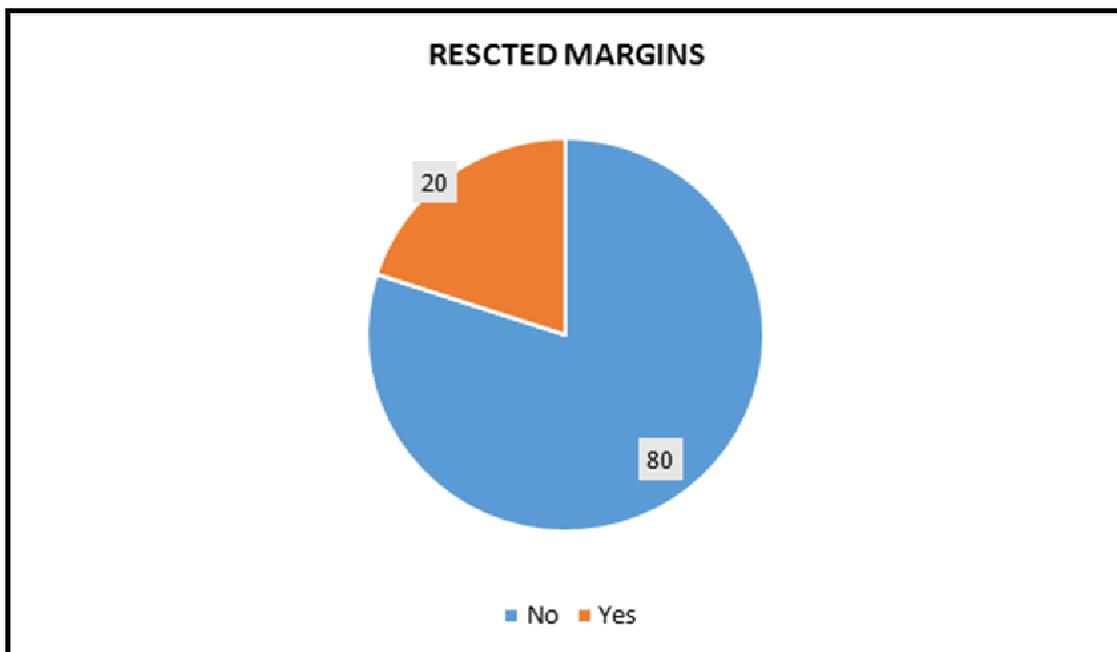


**Table 14: Percentage distribution of study population by margin positivity**

<b>RESECTED MARGINS</b>	<b>Frequency</b>	<b>Percent</b>
No	24	80.0
Yes	6	20.0
Total	30	100.0

On histopathological examination resected margins was positive in around 20% of study patients

**Fig 19: Pie chart showing distribution % by margin positivity**

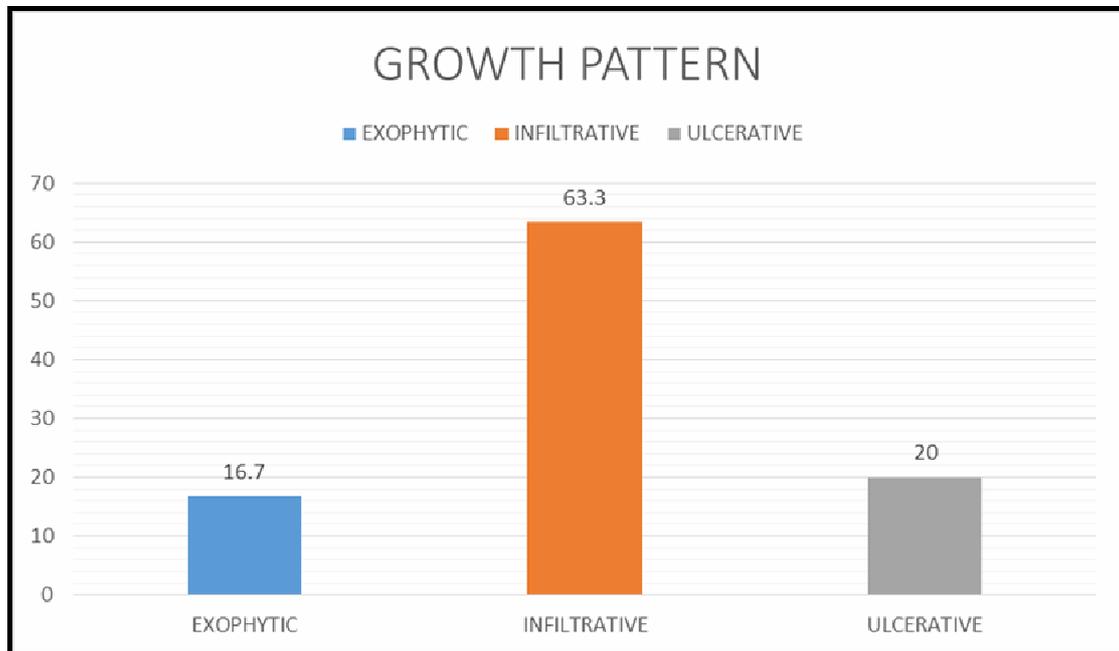


**Table 15: Percentage distribution of study population based of growth pattern of tumor**

<b>GROWTHPATTERN</b>	<b>Frequency</b>	<b>Percent</b>
EXOPHYTIC	5	16.7
INFILTRATIVE	19	63.3
ULCERATIVE	6	20.0
Total	30	100.0

In our study infiltrative growth pattern was 70% , ulcerative growth pattern was 20% and exophytic growth pattern was 10%.

**Fig 20 : Bar diagram showing percentage distribution by growth pattern of tumo**

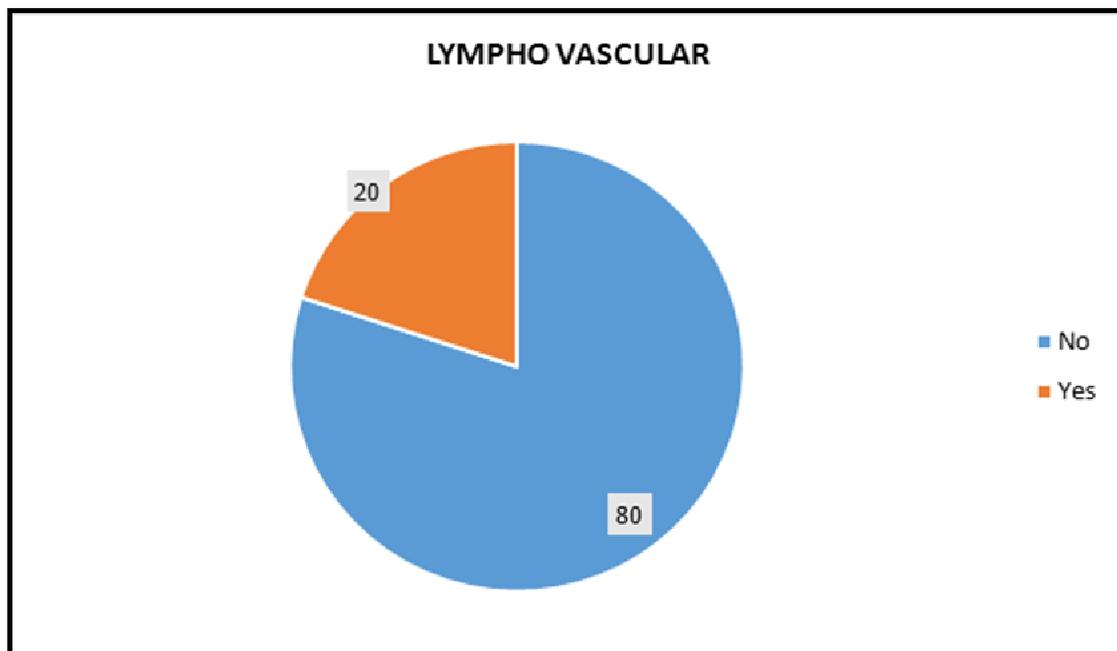


**Table 16: Percentage of distribution by lymphovascular spread of tumor**

<b>LYMPHOVASCULAR</b>	<b>Frequency</b>	<b>Percent</b>
No	24	80.0
Yes	6	20.0
Total	30	100.0

Lympho vascular invasion was found in 20% of study HPE specimens

**Fig 21: Pie chart showing distribution by lymphovascular spread**

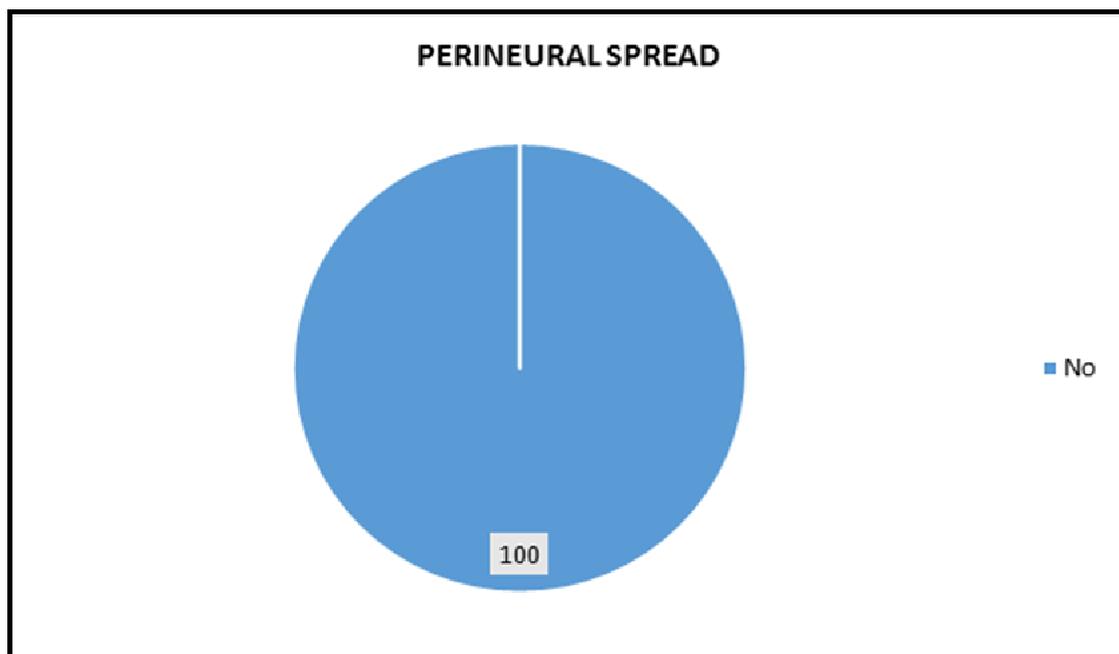


**Table 17: Percentage distribution of study population by perineural spread of tumor**

<b>PERINEURALSREAD</b>	<b>Frequency</b>	<b>Percent</b>
No	30	100.0
Total	30	100.0

There no perineural spread present in biopsy specimen studied.

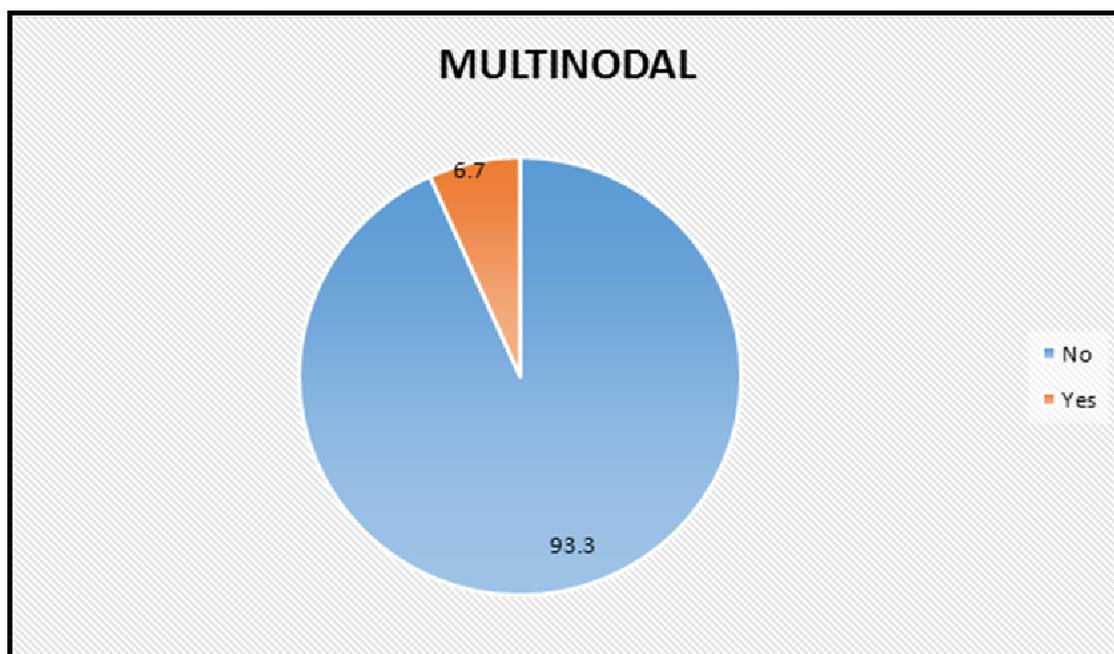
**Fig 22: Pie chart showing % distribution by spread of tumor perineurally**



**Table 18: Percentage distribution of multinodal involvement in study population**

<b>MULTINODAL</b>	<b>Frequency</b>	<b>Percent</b>
No	28	93.3
Yes	2	6.7
Total	30	100.0

**Fig 23 Pie chart showing % distribution of multimodal involvement**

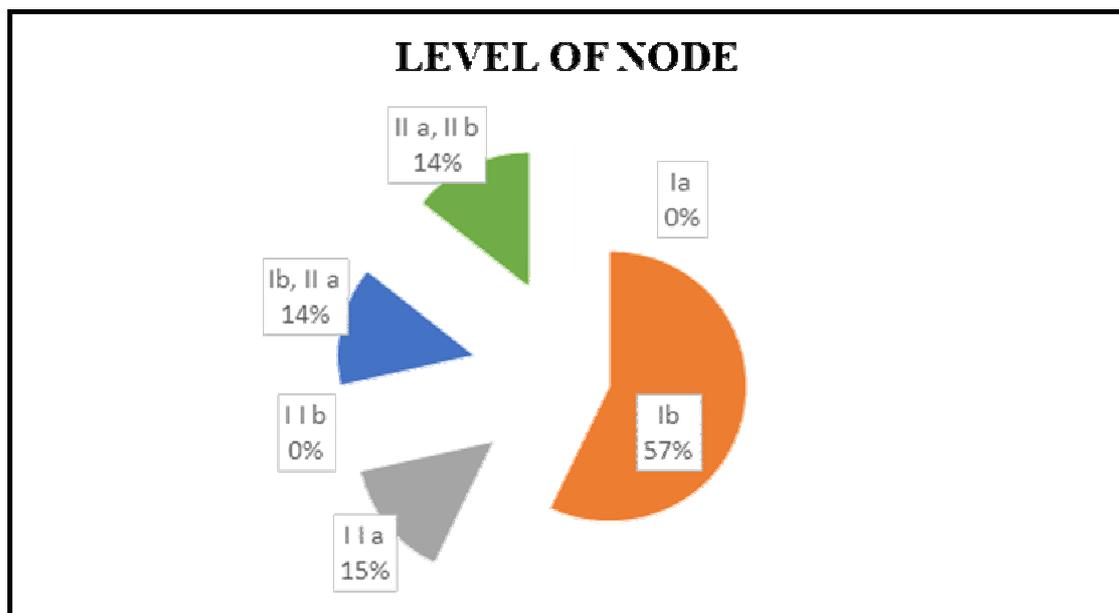


**Fig 19: Pie chart showing distribution percentage by multinodal involvement**

		<b>Tongue</b>	<b>Buccal mucosa</b>	<b>Alveolus</b>
Total cases		26	3	1
Node positive		7(23%)	-	-
	IA	-	-	-
	IB	3(43%)	-	-
	IIA	3(43%)	-	-
	IIB	1(14%)	-	-
	III	-	-	-
	IV	-	-	-

Among the study population almost all occult metastasis positivity were found in carcinoma tongue. The incidence of occult nodal metastasis is 23%. Distribution of node positivity was level IB is 43%, IIA Is 43% and IIB is 14%.

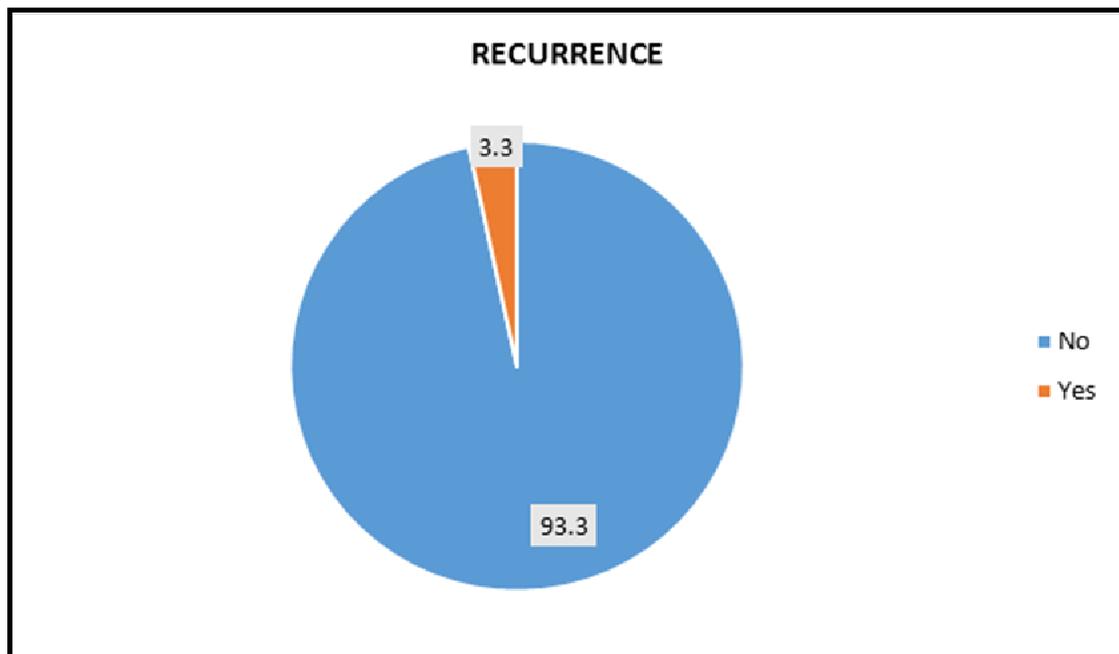
**Fig 24: Pie chart showing % distribution of levels of nodal involvement**



**Table 20: Percentage distribution by recurrence in study population**

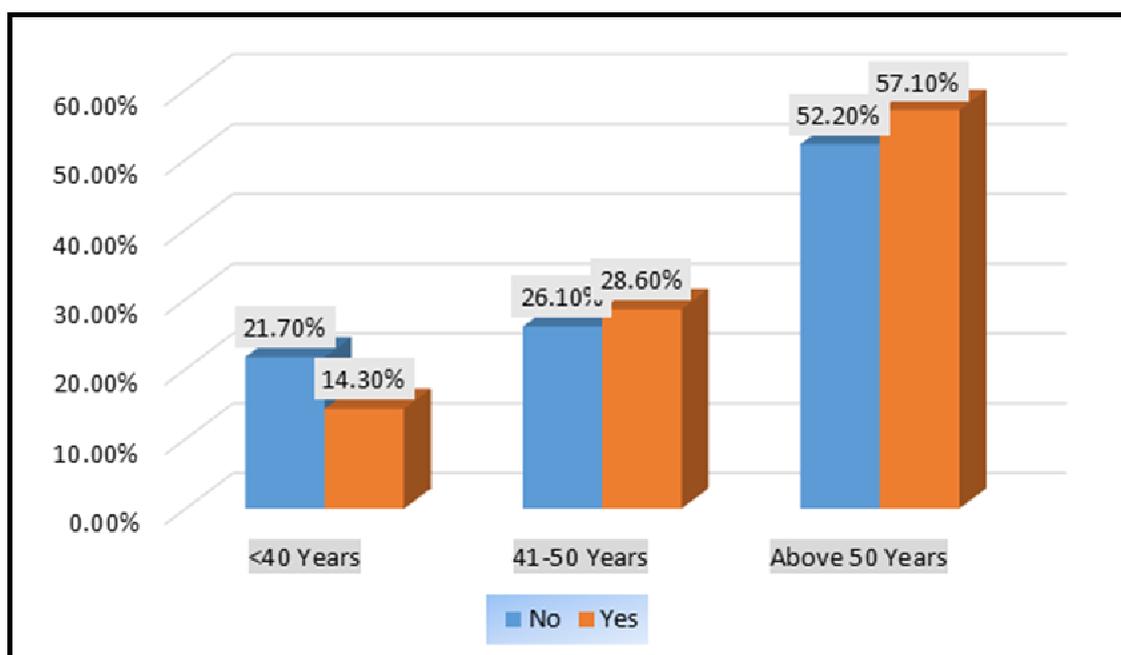
<b>RECURRENCE</b>	<b>Frequency</b>	<b>Percent</b>
No	28	93.3
Yes	2	3.3
Total	30	100.0

**Fig25: Distribution % of multimodal involvement among the study group**



**Table 21: Distribution % of node involvement among different age groups**

Crosstab					
			Node Involvement		Total
			No	Yes	
Age Group	<40 Years	Count	5	1	6
		% within Node Involvement	21.7%	14.3%	20.0%
	41-50 Years	Count	6	2	8
		% within Node Involvement	26.1%	28.6%	26.7%
	Above 50 Years	Count	12	4	16
		% within Node Involvement	52.2%	57.1%	53.3%
Total		Count	23	7	30
		% within Node Involvement	100.0%	100.0%	100.0%

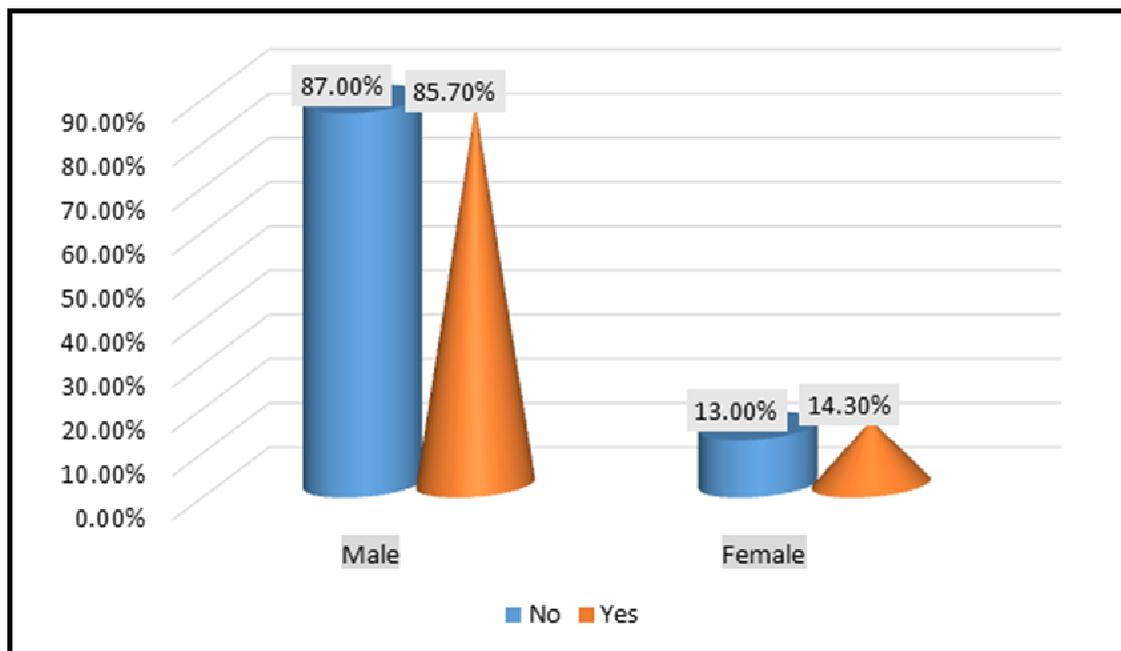


**Table 22 : Comparison of node involvement with sex among the study population**

			Node involvement		Total
			No	Yes	
Sex	Male	Count	20	6	26
		% within Node Involvement	87.0%	85.7%	86.7%
	Female	Count	3	1	4
		% within Node Involvement	13.0%	14.3%	13.3%
Total		Count	23	7	30
		% within Node Involvement	100.0%	100.0%	100.0%

Pearson Chi-Square=0.007 p=0.933

**Fig 27 : Comparison of node involvement with sex in the study population**

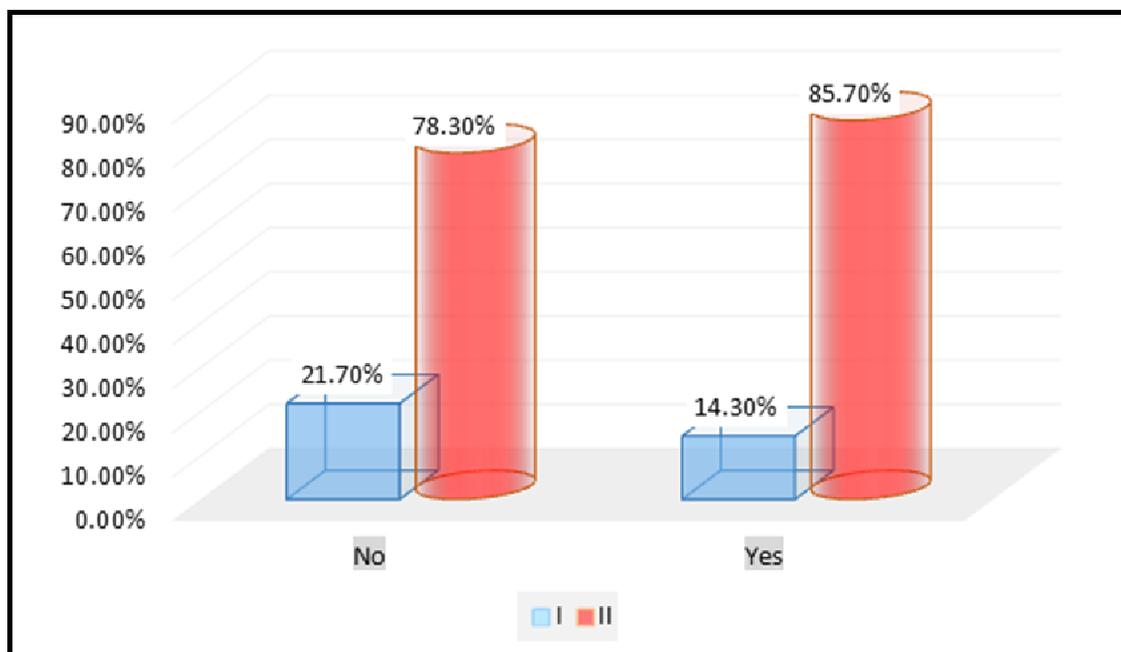


**Table 23: Comparison of node involvement and tobacco usage**

			Node Involvement		Total
			No	Yes	
TOBACCO USGAE	No	Count	5	1	6
		% within Node Involvement	21.7%	14.3%	20.0%
	Yes	Count	18	6	24
		% within Node Involvement	78.3%	85.7%	80.0%
Total		Count	23	7	30
		% within Node Involvement	100.0%	100.0%	100.0%

Pearson Chi-Square=0.186 p=0.666

**Fig 28: Distribution % comparison of node involvement and tobacco usage**

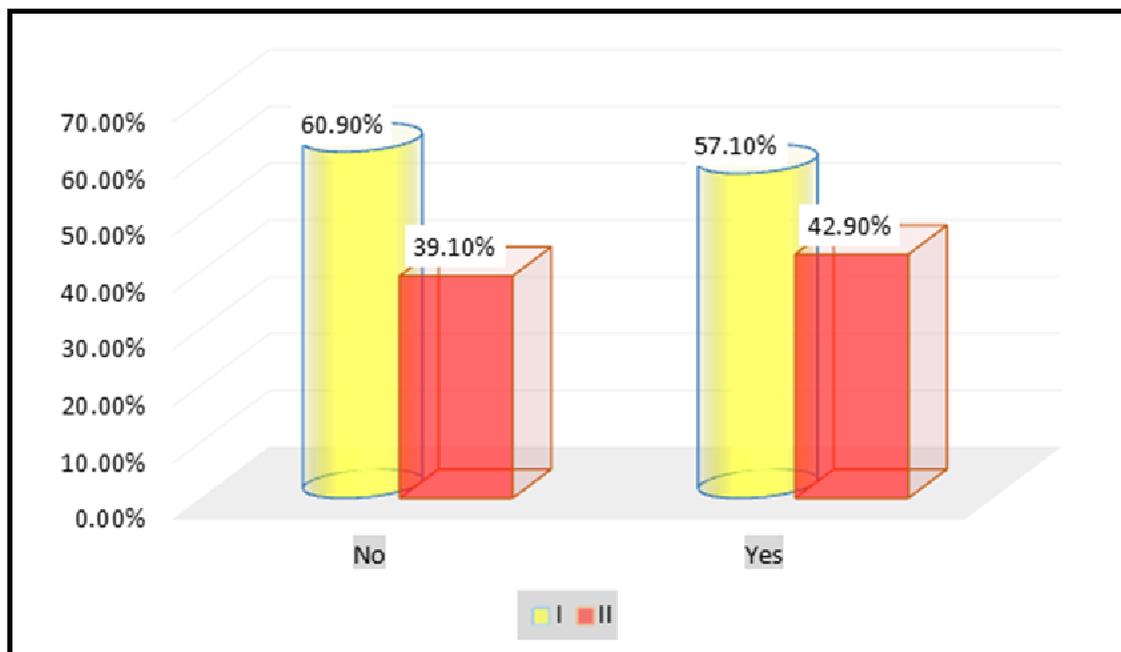


**Table 24: Comparison of alcohol usage and node involvement among the study group**

			Node Involvement		Total
			No	Yes	
Alcohol Usage	No	Count	14	4	18
		% within Node Involvement	60.9%	57.1%	60.0%
	Yes	Count	9	3	12
		% within Node Involvement	39.1%	42.9%	40.0%
Total		Count	23	7	30
		% within Node Involvement	100.0%	100.0%	100.0%

Pearson Chi-Square=0.031 p=0.860

**Fig 29: Comparison of alcohol usage and node involvement**

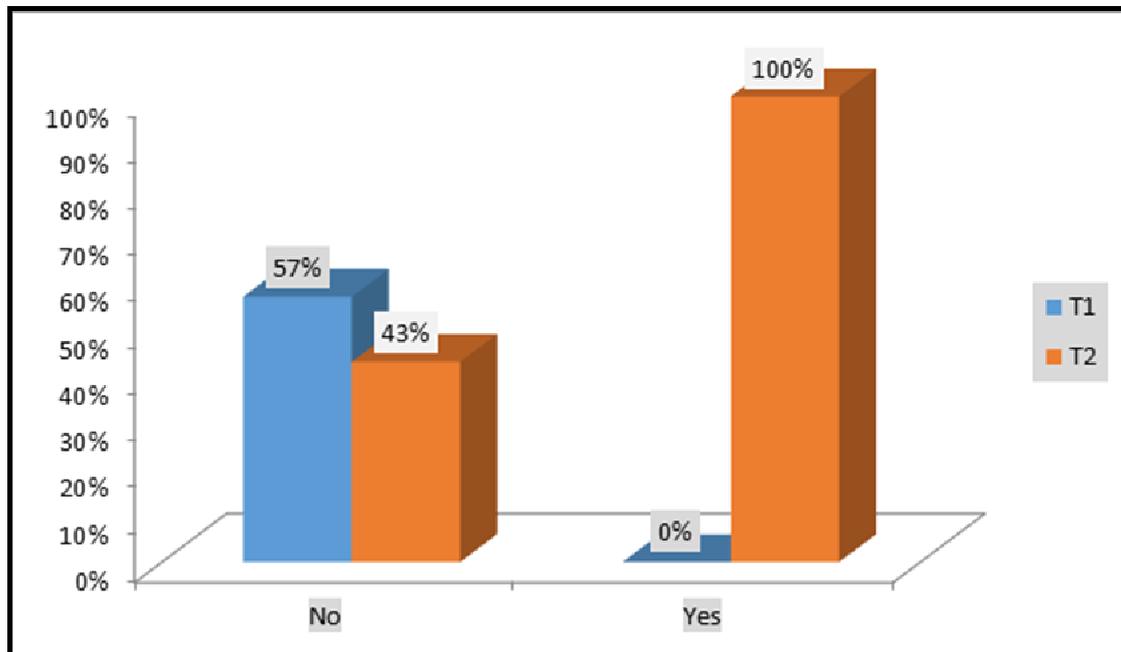


**Table25 : Comparison of node involvement and tumor staging**

			Node Involvement		Total
			No	Yes	
Stage	T1	Count	13	0	13
		% within Node Involvement	56.5%	0.0%	43.3%
	T2	Count	10	7	17
		% within Node Involvement	43.5%	100.0%	56.7%
Total	Count	23	7	30	
	% within Node Involvement	100.0%	100.0%	100.0%	

Pearson Chi-Square=6.982\*\* p=0.008

**Fig 30 : Comparison of node involvement and tumor staging**

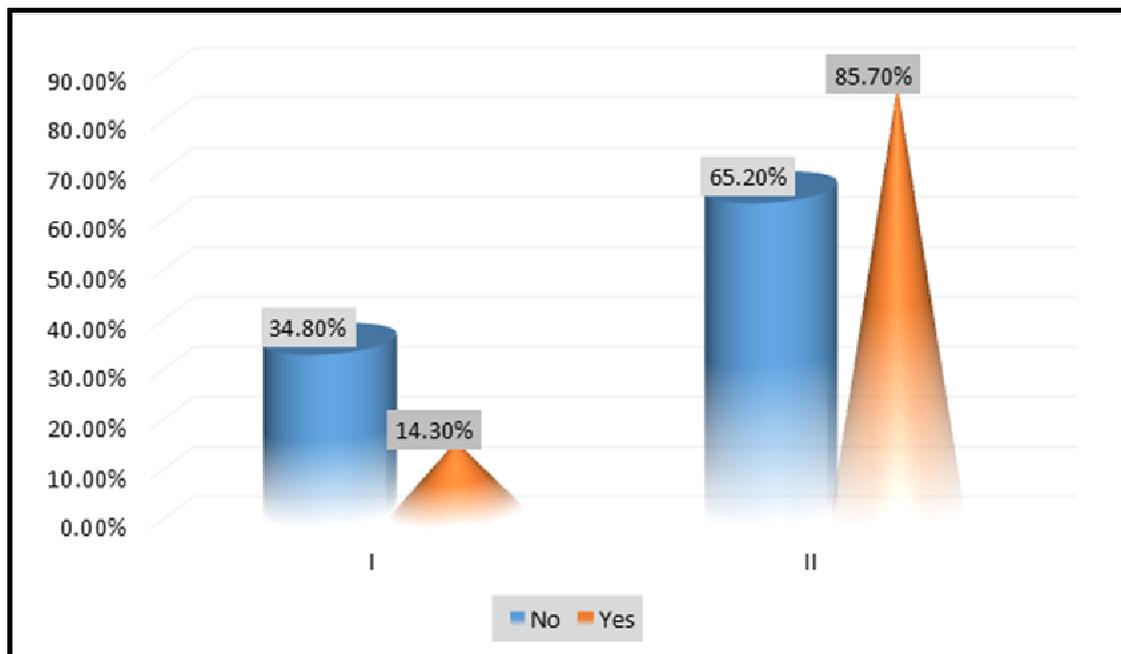


**Table 26 : Percentage comparison of tumor grading and node involvement**

			Node Involvement		Total
			No	Yes	
Grade	I	Count	8	1	9
		% within Node Involvement	34.8%	14.3%	30.0%
	II	Count	15	6	21
		% within Node Involvement	65.2%	85.7%	70.0%
Total	Count	23	7	30	
	% within Node Involvement	100.0%	100.0%	100.0%	

Pearson Chi-Square=1.074 p=0.300

**Fig 31: Percentage comparison of tumor grading and node involvement**

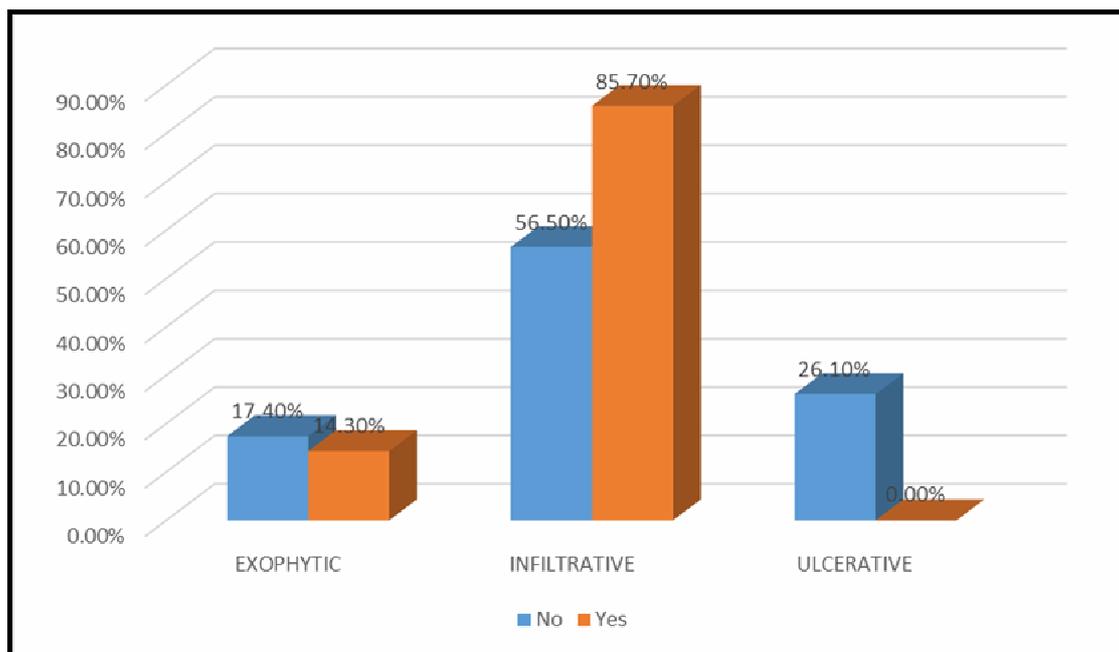


**Table 27: Comparison of growth pattern of tumor with node involvement**

			Node Involvement		Total
			No	Yes	
Growth Pattern	Exophytic	Count	4	1	5
		% within Node Involvement	17.4%	14.3%	16.67%
	Infiltrative	Count	13	6	19
		% within Node Involvement	56.5%	85.7%	63.33%
	Ulcerative	Count	6	0	6
		% within Node Involvement	26.1%	0.0%	20.00%
Total	Count	23	7	30	
	% within Node Involvement	100.00%	100.00%	100.00%	

Pearson Chi-Square=5.86\*p=0.04

**Fig 32 : Comparison of growth pattern of tumor with node involvement**

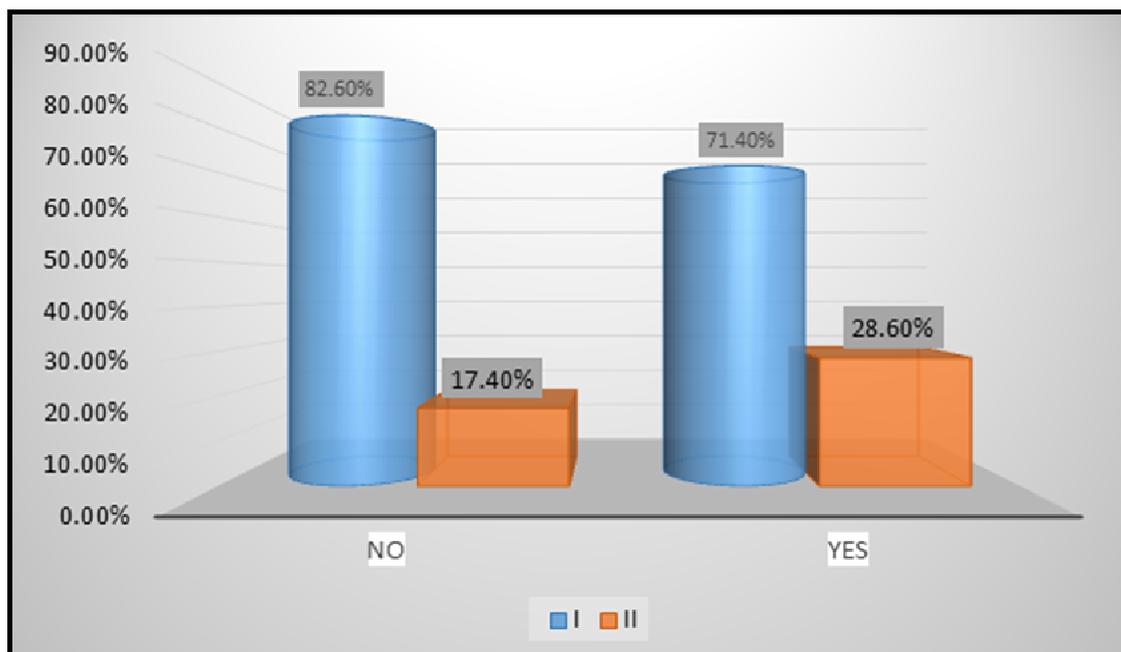


**Table 28: Comparison between margin positivity and node involvement**

			Node Involvement		Total
			No	Yes	
Resected margins	No	Count	19	5	24
		% within Node Involvement	82.6%	71.4%	80.0%
	Yes	Count	4	2	6
		% within Node Involvement	17.4%	28.6%	20.0%
Total		Count	23	7	30
		% within Node Involvement	100.0%	100.0%	100.0%

Pearson Chi-Square=0.419 p=0.517

**Fig-33 : Comparison between margin positivity and node involvement**

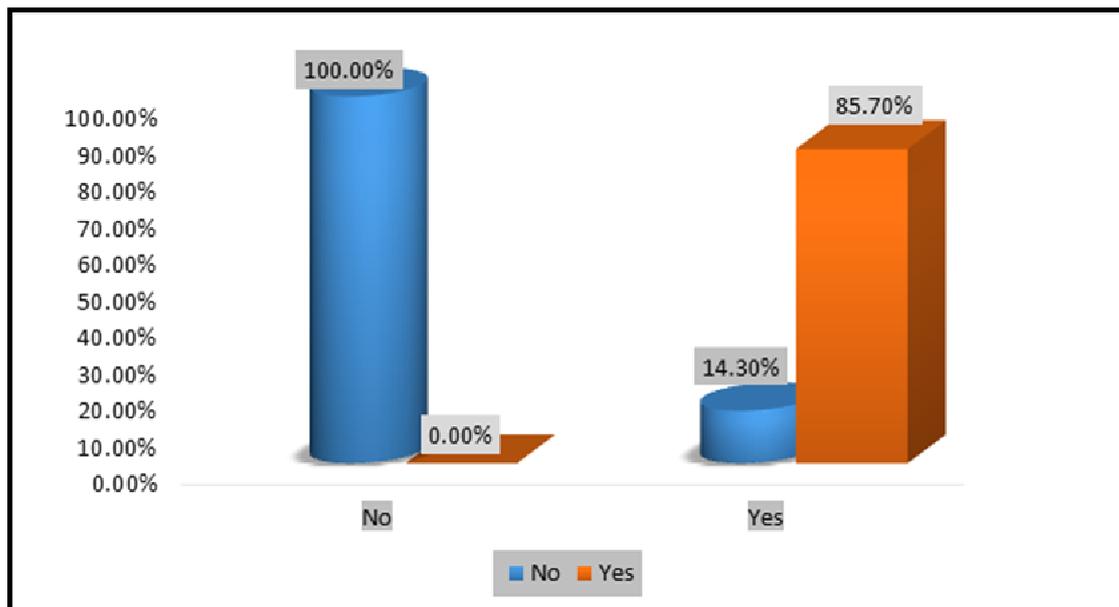


**Table 29 : Comparison of lymphovascular spread and node involvement in the study population**

			Node Involvement		Total
			No	Yes	
Lympho vascular	No	Count	23	1	24
		% within Node Involvement	100.0%	14.3%	80.0%
	Yes	Count	0	6	6
		% within Node Involvement	0.0%	85.7%	20.0%
Total	Count	23	7	30	
	% within Node Involvement	100.0%	100.0%	100.0%	

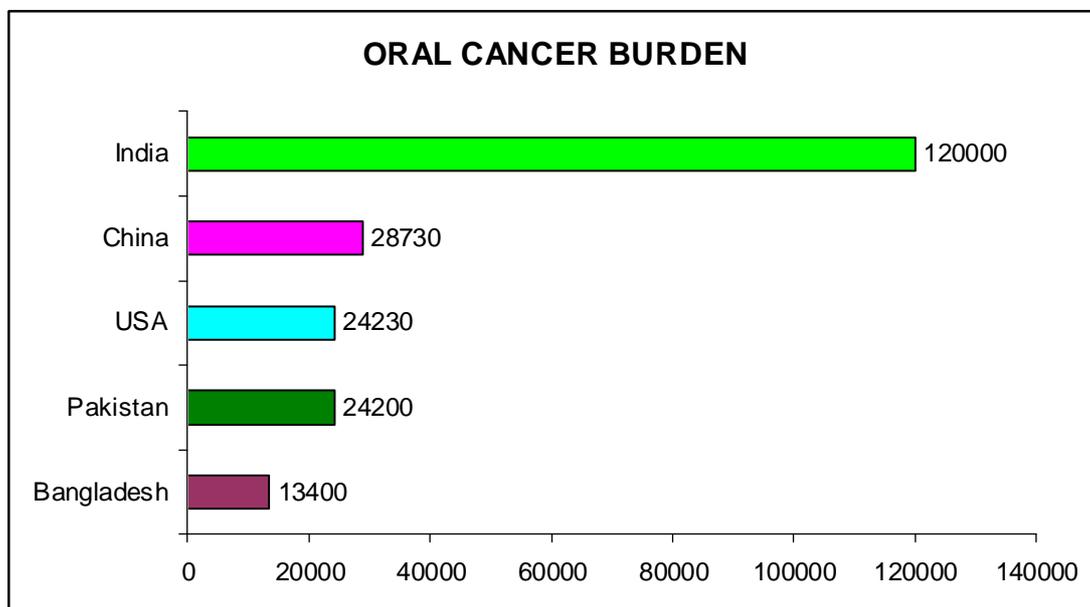
Pearson Chi-Square=24.643\*\* p<0.001

**Fig 34 : Comparison of lymphovascular spread and node involvement in the study population**



## DISCUSSION

The above study was conducted at the Upgraded Institute of Otorhinolaryngology, Madras medical College. After methodical history taking and clinical examination and radiological examination and biopsy confirmation of operable oral cavity tumors .Elective neck dissection was done removing Level I,II,III and IV . specimen observed pathological examination of following parameters number of nodes, level of node, perivascular and lymphovascular invasion and relation between tumor staging and occult nodal positivity.



Source: globocon 2018, IARC

India Rank 1<sup>st</sup> and accounts for 33.8% of new oral cancer burden in the world.

## **AGE AND SEX DISTRIBUTION**

The age group of the patients studied was between 30yrs to 60yrs. Out of this percentage of people ranging between age groups 30 and 40yrs was 20%, and that of 41 to 50 years was 26.7 % and above 50 years was 53.3%. The median age in above study group was 49years.

In our study, although the incidence is seen in various age groups more than half of the study population is over 50 years of age which is similar to various other studies. Although the incidence of the disease is more in patients over the age of 50, there is no significant correlation between the increasing age and occult neck metastases in our study

Carcinoma tongue has multiple factors affecting. it's incidence and male sex preponderance is also one among them. In our study nearly 86% of the study population are males thus indicating a greater incidence rate in male.

Although male gender are more predominantly affected due to various factors such as increased rates of tobacco and alcohol usage by males as compared to females, there is no significant correlation

between the sex of the patient and the occurrence of occult neck metastases in our study.

### **TOBACCO AND ALCHOHOL USAGE**

A majority of our patients had tobacco usage history (around 80%) which included all forms such as tobacco smoking and smokeless tobacco products. In contrary to the increased incidence of the disease in the smoking population, the occult neck node positivity had no significant correlation with use of tobacco.

Similarly there was no significant correlation between the alcohol usage and incidence of occult neck metastases.

### **COMORBID CONDITIONS**

Only 8 patient (40% of study population) had associated comorbidities and all the occult neck node positive cases had no other comorbidities.

And hence there is no significant association between the comorbidities and occurrence of occult neck metastases in our study.

## **SITE OF PRIMARY**

In our study, 10 % of the study population had the primary lesion in buccal mucosa, around 3% of them had carcinoma lower alveolus, and a majority of the study group over 80% had carcinoma tongue. Hence the majority of them have oral tongue as the primary site of lesion.

*Table-30: site of primary*

<b>STUDY</b>	<b>SITE OF PRIMARY</b>
D cruz[29]	Buccal mucosa -13.7% Oral tongue – 85.28%
Present study	Oral tongue- 86.75 Buccal mucosa-10% Lower alveolus-3.3%

Kligerman et al<sup>[24]</sup> 21 containing SCC of oral tongue and floor of mouth also demonstrated that there were no significant differences in occult nodal metastasis between the two oral cancers

## **STAGE OF TUMOR**

All the patients in our study population had either T1 or T2 lesion and over half the population had T2 lesion.

In present study 7 patients among 30 patients studied had nodal involvement and almost all node positive cases were T2 stage

Hence statistically significant correlation was found between the tumor T staging and the incidence of occult neck metastases. Increase in tumor staging is associated with increased incidence of occult node positivity.

### INCIDENCE OF CERVIAL NODE METASTASIS

*Table 31: Incidence of occult metastasis in various study group are*

<b>Study</b>	<b>Incidence in elective neck dissection group %</b>	<b>Incidence in observation group</b>
Fakih et al[33]	30	57.5
Franceschi et al[36]	20	19.5
Lydiatt et al[8]	15.9	26.3
Yuen et al[37]	9.1	46.7
Dias et al[31]	NP	35.3
Goto et al[38]	15.1	26.3
Al rajhi et al[27]	19.4	37.9
D'cruz et al[39]	5.7	47
An et al[40]	NIL	13.9
Lin et al[41]	17.2	42.5

Incidence of occult metastasis in various studies ranging from 21-45%.

In our study the incidence was 23% . out of 27 patients with tongue carcinoma seven patients had occult metastasis.

## LEVEL OF NODE INVOLVEMENT

**Hindle et al**<sup>[42]</sup>, found in their study about 35% of cases that had neck dissection showed positive nodes (occult metastasis), this was similar to others. The lymph nodes at highest risk of occult metastases from oral cavity cancers are those at levels I, II, and III. The metastatic rates to these sites are 58% (level I), 51% (level II), 26% (level III), 9% (level IV), and 2 % (level V) (Poddar et al., 1990).

## PREVALENCE OF LEVEL IV AND SKIP METATSTISIS IN VARIOUS STUDIES

*Table 32:*

Study	Site	Prevalence of level iV	Skip metastsis level III and IV
Byers et al[35]	Oral Tongue	-	15.8
Khafif et al[43]	Oral Tongue	5.9	-
Kaya et al[44]	Oral Tongue	2.8	-
Dias et al[31]	Oral Tongue	1.5	0.5
Akthar et al[45]	Oral Tongue	4.2	0
Huang et al[46]	Oral Tongue	5.4	2.7
Present study	Oral Tongue	Nil	0

In present study level of node involvement was Level Ib , IIA and IIb were 43% ,43% and 14% respectively. There is no evidence of occult node positive in Level IA, III and IV. In our study there no skip metastasis also found.

## **INCIDENCE OF LEVEL IIB**

**Elsheik et al**<sup>[47]</sup> found the incidence of metastasis in level IIB in patients with primary tumor located in tongue was 22%

**Maher et al**<sup>[48]</sup> found Level IIB metastasis in 5.6% and high incidence of level IIB metastasis from tongue

**JC de Vincetti**<sup>[49]</sup> found that incidence of level IIB was 4.7%

In our study the incidence of occult metastasis in Level IIB was 14% as similar to various series

## **GRADING OF TUMOR**

Based on the growth pattern of carcinoma tongue , they can be ulcerative, infiltrative or exophytic and around 60 % of our study group had infiltrative type of carcinoma tongue.

Although the majority of them had infiltrative pattern of growth, there was no significant association between the growth pattern and occult neck metastases incidence.

**Safdar quadar et al**<sup>[51]</sup> study observed that poorly-differentiated tumors had the highest incidence of neck nodal metastasis (56.2%), followed by moderately-differentiated tumors

(25.6%), while well-differentiated tumors were the least affected (4.3%).

In present study According to the grading of the disease, around 70 % of the study population had grade II or moderately differentiated carcinoma and the remaining had grade I lesion. As the grade increases the possibility of neck metastases is more in most of studies but, in our study there was no significant correlation between the grade of the disease and occult neck metastases incidence.

### **GROWTH PATTERN OF TUMOR**

Infiltrating tumor growth pattern have high incidence of occult nodal metastasis.

In our study the percentage of Infiltrative, ulcerative and exophytic growth pattern were 63% , 20% and 16% respectively.

Percentage of node involvement in infiltrative growth pattern was 85%.

There is statistically significant correlation found between infiltrative growth pattern of tumor and occult cervical nodal metastasis

## **PERINEURAL SPREAD AND LYMPHOVASCULAR LESION**

None of our patients had Perineural involvement upon histopathological examination of the resected specimen.

Among the various prognostic factors, the presence of lymphovascular invasion of the tumor is a very significant determinant of the progression of the disease.

Around 20 % of our study group had histopathological examination showing lymphovascular invasion positivity and also there was significant correlation between lymphovascular invasion and occult neck metastases. Around 86 % of lymphovascular invasion positive patients had occult neck metastases and hence the significance.

In R. K. De Silva et al<sup>55</sup> Lymphovascular invasion of SCC of the oral tongue, base of the tongue, lip, floor of the mouth, buccal mucosa, and retromolar trigone were 42.85%, 66.67%, 58.06%, 57.89%, 72.72%, and 80.00%, respectively. No statistical significance was found among lymphovascular invasion of primary tumor, clinical staging, and pathologic differentiation.

In our series there statistically significant correlation between the Lymphovascular invasion and node positivity among 7 node

positive case around 6 node positivity is associated with lymphovascular invasion.

### **MARGIN STATUS**

All patients in the study group had histopathological sampling of the resected diseased specimen done and among which 20% of them with resected margin positivity had occult neck node positivity. There was no significant association between resected margin positivity and occult neck metastases

### **OVERALL SURVIVAL AND DISEASE FREE SURVIVAL**

Upon following up the patients, around 2 patients had disease recurrence and one patient did not survive.

*Table 33: overall survival in various studies*

<b>Study</b>	<b>Observation group</b>	<b>Neck dissection group</b>
Lydiat et al[8]	48%	67%
Yii et al[52]	65%	75%
Keski santti[53]	66%	63%
Huang et al[46]	75%	87.2%
D'cruz et al[49]	62%	69%
Present study (6month)	NP	94%

**Table 34 : Disease specific free survival in various studies**

<b>Study</b>	<b>Observation group</b>	<b>Neck dissection group</b>
Keski santti[53]	77%	82%
Yuen et al[37]	87%	89%
Feng et al[54]	61.9%	79.2%
D'cruz[49]	68%	74%

**Vandenbrouck et al<sup>[55]</sup>** and **Anthony Yuen et al<sup>[37]</sup>** however found no survival advantage of elective neck dissection as compared to observation and delayed intervention.

Thus from the discussion of our findings, it may be seen that elective neck dissection confers benefit for patients with N0 neck and though survival is better in this group.

In our study we followed up 6 months to 3yrs. Upon followup 1 patient developed recurrence within 6months period. And 1 patient died due to other complication. Overall survival in our study was in 6month to 3yr follow up period was 94%.

Few significant factors seem to emerge from our analysis. The incidence of occult metastases is in the order of 23 % which is generally considered as an indication for elective Neck dissection treatment and hence all T1 & T2 carcinomas of oral cavity merit elective treatment. The factors found to have significant influence of nodal metastases include the T stage and infiltrating pattern of growth and presence of lymphovascular invasion.

## CONCLUSION

The incidence of occult ipsilateral neck nodal metastases in present study is around 23%

The incidence of Level IB node are 43%, IIA are 43%, and IIB was 14%. All node positive cases are T2 stage.

Higher T stage and an infiltrating pattern of growth of the Primary were the only significant predictive factors of higher Incidence of neck metastases among the factors analyzed.

Almost all cases occult metastasis the primary was Oral Tongue.

Patients undergoing elective neck dissection had a significantly better disease free and overall survival advantage

Elective neck dissection is to be considered for treatment Of all N0 necks in early oral cavity carcinoma

Level IIB must be included in the neck dissection specimen wherever tongue is the primary to achieve locoregional control and prevent recurrence

Better models predicting occult metastases are required to identify patients with higher incidence of neck node metastases and further randomized prospective studies comparing the Treatment options are also the need of the hour.

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**INSTITUTIONAL ETHICS COMMITTEE  
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**CERTIFICATE OF APPROVAL**

**To**

**DR. JOTHIESWARAN,**

MS (ENT) Post Graduate,

Upgraded Institute of Otorhinolaryngology,

Madras Medical College & Rajiv Gandhi Govt. General Hospital,  
Chennai - 03.

**Dear DR. JOTHIESWARAN,**

The Institutional Ethics Committee has considered your request and approved your study titled **"A COMPREHENSIVE STUDY ON SELECTIVE NECK DISSECTION IN MEASURING OUTCOME AND PROGNOSIS IN OPERABLE ORAL CAVITY MALIGNANCY WITH NO NECK NODE" - NO.13122018**

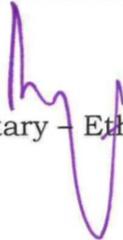
The following members of Ethics Committee were present in the meeting held on **04.12.2018** conducted at Madras Medical College, Chennai 3

- |  |                      |
|--|----------------------|
| 1. Prof.P.V.Jayashankar  | :Chairperson         |
| 2. Prof.R.Jayanthi,MD.,FRCP(Glasg)., Dean,MMC,Ch-3                     | : Deputy Chairperson |
| 3. Prof.Sudha Seshayyan,MD., Vice Principal,MMC,Ch-3                   | : Member Secretary   |
| 4. Prof.N.Gopalakrishnan,MD,Director,Inst.of Nephrology,MMC,Ch         | : Member             |
| 5. Prof.S.Tito,MD,Prof. Inst. of Int.Med,MMC, Ch-3                     | : Member             |
| 6. Prof.Afee Asma,Director, Inst. of Gen.Surgery,MMC                   | : Member             |
| 7. Prof.Shobha, Prof, Inst.of O&G, Chennai                             | : Member             |
| 8. Prof.Remma Chandramohan,Prof.of Paediatrics,ICH,Chennai             | : Member             |
| 9. Prof. Sudha, Prof. Inst. of Pharmacology,MMC,Ch-3                   | : Member             |
| 10.Prof.K.Ramadevi,MD., Director, Inst. of Bio-Chemistry,MMC,Ch-3      | : Member             |
| 11.Prof.Bharathi Vidya Jayanthi,Director, Inst. of Pathology,MMC,Ch-3: | Member               |
| 12.Thiru S.Govindasamy, BA.,BL,High Court,Chennai                      | : Lawyer             |
| 13.Tmt.Arnold Saulina, MA.,MSW.,                                       | :Social Scientist    |
| 14.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



## Urkund Analysis Result

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### Sources included in the report:

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<https://www.cancernetwork.com/cancer-management/head-and-neck-tumors/page/0/4>

### Instances where selected sources appear:

## **PLAGIARISM CERTIFICATE**

This is to certify that this Dissertation work titled **“A COMPREHENSIVE STUDY ON SELECTIVE NECK DISSECTION IN MEASURING OUTCOME AND PROGNOSIS IN OPERABLE ORAL CAVITY MALIGNANCY WITH N0 NECK NODE”** of the candidate Dr.JOTHIESWARAN.K with registration Number 221714004 for the award of M.S. ENT in the branch of IV.

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 result shows 10% percentage of plagiarism in the dissertation.

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**PROFORMA**

<b>NAME :</b>
<b>AGE/SEX:</b>
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<b>ADDRESS :</b>
<b>DOA :</b>
<b>CHIEF COMPLAINTS:</b>
<b>CO-MORBID CONDITIONS:</b>
<b>LOCAL EXAMINATION:</b>
<b>INSPECTION:</b>
<b>PALPATION:</b>
<b>EXAMINATION OF NECK:</b>
<b>OTHER SYSTEMS:</b>

**ROUTINE INVESTIGATION:**

**SPECIFIC INVESTIGATIONS:**

**USG NECK:**

**CECT NECK:**

**FNAC REPORT:**

**PROVISIONAL DIAGNOSIS:**

**PLAN:**

**DATE OF SURGERY:**

**OPERATIVE NOTES:**

**POST OP BIOPSY REPORT:**

**PRIMARY SPECIMEN:**

**NODAL SPECIMEN:**

**POST OP FOLLOWUP:**



## INFORMATION SHEET

We are conducting “***A COMPREHENSIVE STUDY ON SELECTIVE NECK DISSECTION IN MEASURING OUTCOME AND PROGNOSIS IN OPERABLE ORAL CAVITY MALIGNANCY WITH NO NECK NODE***” at the Upgraded Institute of Otorhinolaryngology, Madras Medical College & Rajiv Gandhi Government General Hospital, Chennai – 600003.

In this study the occult positivity rate of the Oral cavity Malignancies with No Neck Node is studied by doing Selective Neck Dissection for all the patients in the inclusion criteria and examining the histopathology report of their neck nodes.

At the time of announcing the results and suggestions, name and identity of the patients will be confidential.

Taking part in this study is voluntary. You are free to decide whether to participate in this study or to withdraw at any time; your decision will not result in any loss of benefits to which you are otherwise entitled.

The results of the special study may be intimated to you at the end of the study period or during the study if anything is found abnormal which may aid in the management or treatment.

***Signature of Investigator***

***Signature of Participant***

***Date :***

## ஆராய்ச்சி தகவல் தாள்

ஆராய்ச்சி தலைப்பு

NO கழுத்து முனைவுடன் வாய் புற்றுநோய் உள்ள தேர்ந்தெடுக்கப்பட்ட கழுத்து அறுவை சிகிச்சை பற்றிய ஒருங்கிணைந்த ஆய்வு

ஆய்வாளர் : மரு.ஜோதீஸ்வரன்,  
மூன்றாம் ஆண்டு, காது மூக்கு தொண்டை பிரிவு  
சென்னை மருத்துவக் கல்லூரி, சென்னை-600 003.

நீங்களும் இந்த ஆராய்ச்சியில் பங்கேற்க நாங்கள் விரும்புகிறோம். இதில் உங்களுடைய தகவல்களை ஆராய்வோம். இதனால் தங்களது ஆய்வறிக்கையோ, அன்றாட செயல்பாடுகளோ பாதிக்கப்படாது என்று தெரிவித்துக் கொள்கிறோம்.

முடிவுகளை அல்லது கருத்துக்களை வெளியிடும் போதோ அல்லது ஆராய்ச்சியின் போதோ தங்களது பெயரையோ அல்லது அடையாளங்களையோ வெளியிடமாட்டோம் என்பதையும் தெரிவித்துக் கொள்கிறோம்.

இந்த ஆராய்ச்சியில் பங்கேற்பது தங்களுடைய விருப்பத்தின் பேரில்தான் இருக்கிறது. மேலும் நீங்கள் எந்த நேரமும் இந்த ஆராய்ச்சியில் இருந்து பின் வாங்கலாம் என்பதையும் தெரிவித்துக்கொள்கிறோம். இந்த வாய் புற்றுநோய் தீசு பரிசோதனை முடிவுகளை ஆராய்ச்சியின் போது அல்லது ஆராய்ச்சியின் முடிவில் தங்களுக்கு அறிவிப்போம் என்பதையும் தெரிவித்துக் கொள்கிறோம்.

பங்கேற்பாளர் கையொப்பம் ..... இடம் ..... தேதி.....

பங்கேற்பாளர் பெயர் மற்றும் விலாசம் .....

ஆராய்ச்சியாளர் கையொப்பம்..... இடம் ..... தேதி.....

# ஆராய்ச்சி ஒப்புதல் கடிதம்

## ஆராய்ச்சி தலைப்பு

NO கழுத்து முனைவுடன் வாய் புற்றுநோய் உள்ள தேர்ந்தெடுக்கப்பட்ட கழுத்து அறுவை சிகிச்சை பற்றிய ஒருங்கிணைந்த ஆய்வு

எனக்கு விளக்கப்பட்ட விஷயங்களை நான் நன்கு புரிந்தகொண்டு எனது சம்மதத்தைத் தெரிவிக்கிறேன்.

இந்த ஆய்வில் பிறரின் நிர்பந்தமின்றி என் சொந்த விருப்பத்தின் பேரில்தான் பங்கு பெறுகிறேன் மற்றும் நான் இந்த ஆராய்ச்சியிலிருந்து எந்நேரமும் பின்வாங்கலாம் என்பதையும் அதனால் எந்த பாதிப்பும் ஏற்படாது என்பதையும் நான் புரிந்து கொண்டேன்.

நான் இந்த ஆராய்ச்சியின் விஷயங்களை கொண்ட தகவல் தாளைப் பெற்றுக்கொண்டேன்.

நான் என்னுடைய சுய நினைவுடன் மற்றும் முழு சுதந்திரத்துடன் இந்த மருத்துவ ஆராய்ச்சியில் என்னைச் சேர்த்துக்கொள்ள சம்மதிக்கிறேன்.

பங்கேற்பாளர் கையொப்பம் ..... இடம் ..... தேதி.....

பங்கேற்பாளர் பெயர் மற்றும் விலாசம் .....

ஆராய்ச்சியாளர் கையொப்பம்..... இடம் ..... தேதி.....

S. NO	NAME	AGE	SEX	DIAGNOIS	TUMOR SIZE	STAGE	COMORBID	GRADE	GROWTH PATTERN	TOBACCO USGAE	ALCOHOL USAGE	NODE INVOLVEMENT	RESCTED MARGINS	PERINEURAL SPREAD	LYMPHO VASCULAR	MULTINODAL	RECURRENCE
1	CHINNAPA	55	M	CA TONGUE	3*3.5	T2	NIL	I	INFILTRATIVE	YES	NO	NEGATIVE	NEGATIVE	NIL	NIL	NIL	NIL
2	AANDAL	60	F	CA TONGUE	0.5*0.5	T1	NIL	I	ULCERATIVE	NO	NO	NEGATIVE	NEGATIVE	NIL	NIL	NIL	NIL
3	KANNAN	50	M	CA TONGUE	4*2	T2	YES	II	INFILTRATIVE	YES	YES	NEGATIVE	POSITIVE	NIL	NIL	NIL	YES/DEAD
4	VENKATRAMAN	28	M	CA TONGUE	3*2	T2	NIL	II	INFILTRATIVE	YES	NO	NEGATIVE	POSITIVE	NIL	NIL	NIL	NIL
5	VIJAYAKUMAR	39	M	CA TONGUE	3*2	T2	NIL	II	INFILTRATIVE	YES	NO	POSITIVE	NEGATIVE	NIL	YES	NIL	NIL
6	SELVARAJ	60	M	CA BUCCAL MUCOSA	4*3	T2	YES	II	INFILTRATIVE	YES	YES	NEGATIVE	POSITIVE	NIL	NIL	NIL	NIL
7	ZAHEER HUSSAIN	52	M	CA TONGUE	2*2	T1	YES	I	ULCERATIVE	YES	YES	NEGATIVE	NEGATIVE	NIL	NIL	NIL	NIL
8	RAJAVEL	48	M	CA BUCCAL MUCOSA	3*2	T2	NIL	II	ULCERATIVE	YES	NO	NEGATIVE	NEGATIVE	NIL	NIL	NIL	NIL
9	GOMATHY	43	F	CA TONGUE	2.5*0.5	T2	NIL	II	INFILTRATIVE	NO	NO	POSITIVE	NEGATIVE	NIL	YES	NIL	NIL
10	SHANKAR	52	M	CA TONGUE	3*2	T2	NIL	I	INFILTRATIVE	YES	YES	NEGATIVE	NEGATIVE	NIL	NIL	NIL	NIL
11	THANGAPPAN	52	M	CA TONGUE	2*1	T1	NIL	I	ULCERATIVE	NO	YES	NEGATIVE	NEGATIVE	NIL	NIL	NIL	NIL
12	BALAMURUGAN	52	M	CA TONGUE	2*1.5	T2	YES	II	INFILTRATIVE	YES	NO	POSITIVE	POSITIVE	NIL	YES	NIL	NIL
13	KUMAR	46	M	CA TONGUE	2.5*2	T2	NIL	II	INFILTRATIVE	YES	YES	POSITIVE	NEGATIVE	NIL	YES	YES	NIL
14	NARASIMMAN	63	M	CA TONGUE	4*3	T2	NIL	II	EXOPHYTIC	YES	NO	NEGATIVE	NEGATIVE	NIL	NIL	NIL	NIL
15	RAMESH	38	M	CA TONGUE	2.3*1.5	T2	NIL	II	INFILTRATIVE	YES	YES	NEGATIVE	POSITIVE	NIL	NIL	NIL	YES
16	KARTHICK	36	M	CA TONGUE	2*1	T1	NIL	II	INFILTRATIVE	YES	NO	NEGATIVE	NEGATIVE	NIL	NIL	NIL	NIL
17	MOORTHY	50	M	CA TONGUE	2*2	T1	YES	II	ULCERATIVE	NO	NO	NEGATIVE	NEGATIVE	NIL	NIL	NIL	NIL
18	RAJESH	43	M	CA LOWER ALVEOLUS	2*1	T1	NIL	II	INFILTRATIVE	YES	YES	NEGATIVE	NEGATIVE	NIL	NIL	NIL	NIL
19	PARTHIBAN	35	M	CA TONGUE	2.5*1.5	T2	YES	II	INFILTRATIVE	YES	NO	NEGATIVE	NEGATIVE	NIL	NIL	NIL	NIL
20	ANBUMANI	52	M	CA BUCCAL MUCOSA	1.5*1.5	T1	NIL	I	INFILTRATIVE	YES	NO	NEGATIVE	NEGATIVE	NIL	NIL	NIL	NIL
21	ISHAK JAMES	60	M	CA TONGUE	2.5*1.5	T2	YES	II	INFILTRATIVE	YES	YES	POSITIVE	NEGATIVE	NIL	YES	YES	NIL
22	IRUSSAN	49	M	CA TONGUE	2*2	T1	NIL	II	INFILTRATIVE	YES	NO	NEGATIVE	NEGATIVE	NIL	NIL	NIL	NIL
23	RAJA	57	M	CA TONGUE	2.5*1.5	T2	NIL	II	INFILTRATIVE	YES	YES	NEGATIVE	NEGATIVE	NIL	NIL	NIL	NIL
24	RAJAMANICKAM	54	M	CA TONGUE	3*3	T2	YES	II	EXOPHYTIC	YES	YES	NEGATIVE	NEGATIVE	NIL	NIL	NIL	NIL
25	RANJITHAM	40	F	CA TONGUE	2.5*1	T2	YES	II	EXOPHYTIC	NO	NO	POSITIVE	NEGATIVE	NIL	NIL	NIL	NIL
26	JABBAR	56	M	CA TONGUE	2.5*2	T2	YES	II	ULCERATIVE	YES	NO	NEGATIVE	NEGATIVE	NIL	NIL	NIL	NIL
27	MUNIYAMMAL	51	F	CA TONGUE	2.5*1	T2	NIL	II	EXOPHYTIC	NO	NO	NEGATIVE	NEGATIVE	NIL	NIL	NIL	NIL
28	VIJAYARAGHAVAN	58	M	CA TONGUE	1*1	T1	NIL	I	EXOPHYTIC	YES	YES	NEGATIVE	NEGATIVE	NIL	NIL	NIL	NIL
29	MUNIAYSAMY	48	M	CA TONGUE	1.5*1	T1	YES	I	INFILTRATIVE	YES	NO	NEGATIVE	NEGATIVE	NIL	NIL	NIL	NIL
30	KUPPAN	51	M	CA TONGUE	3*2	T2	YES	II	INFILTRATIVE	YES	NO	POSITIVE	POSITIVE	NIL	YES	NIL	NIL