

# INTRAORAL BIOPSY PROCEDURES PERFORMED IN A DENTAL HOSPITAL SETTING -A RETROSPECTIVE STUDY

Harsh Kasabwala, Subhabrata Maiti\*<sup>2</sup> Kiran Kumar Pandurangan<sup>3</sup>

<sup>1</sup>Department of prosthodontics, Saveetha Dental College and Hospitals, Saveetha Institute Of Medical And Technical Sciences Saveetha University, Chennai.

<sup>2</sup>\*Department of prosthodontics, Saveetha Dental College and Hospitals, Saveetha Institute Of Medical And Technical Sciences Saveetha University, Chennai.

<sup>3</sup>Department of prosthodontics, Saveetha Dental College and Hospitals, Saveetha Institute Of Medical And Technical Sciences Saveetha University, Chennai

## Abstract

Biopsy in simple terms means removal of a tissue from a living person for diagnostic purposes. It helps in differentiating an abnormal tissue from a normal one. It helps in diagnosis of various cancers, tumors or any unidentified growth seen during clinical examination. To evaluate the different types of intraoral biopsy procedures performed in an institutional setup in 1 year. It is designed as a retrospective study. A total of 234 patient records who had a growth intraorally and required investigation for the same were acquired. It was done analysing records of 86000 patient data who were treated from March 2019- March 2020. Descriptive statistics were used to analyse the frequency and percentage of the different intraoral biopsies performed. Chi square test was used to evaluate the correlation between age and gender with the different types of biopsy procedures performed. SPSS version 20 software was used to perform statistics. Out of the total data extracted, 80.3 percent underwent incisional biopsy, in 17.5% excisional biopsy was carried out, 1.3% underwent FNAC procedures and 0.9% other biopsy techniques were performed. Maximum biopsy procedures were carried out between the age group of 40- 60 years. More cases were seen among the male population. Age had a positive relation with the type of biopsy performed when chi square test was done p value less than 0.05. Gender a negative correlation with the type of biopsy performed p value more than 0.05. Incisional biopsy was found to be the most commonly performed type of biopsy. Age had a positive correlation with the type of biopsy performed. Gender did not have a significant correlation with the type of biopsy performed.

**Key words:** incisional biopsy; excisional biopsy; FNAC; other types of biopsy procedures.

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## INTRODUCTION

The word biopsy originates from the Greek terms bios (life) and opsia (vision): vision of life. It is an examination of tissue removed from a living body to discover the presence, cause or extent of a disease. The tissue extracted can be examined by a pathologist under a microscope or it can also be done chemically. It is indicated in cases where unidentified lesions or growths persist more than two weeks. Initially these lesions must be explored and evaluated properly for presence of any local irritating factors. If such factors persist, they must be removed and then they should be kept under observation for 15- 20 days. If the lesion still persists, a biopsy should be carried out. Biopsies help to visualise these lesions histologically and help to diagnose a cancer, cyst, tumor etc (Soyele *et al.*, 2019).

The oral environment is very challenging to collect viable tissue cells as it is moist and confined but because of the new advances in biopsy these challenges can be overcome. Whatever the challenges are, the main aim serves to obtain a tissue which can be a satisfactory representative and can be interpreted by the clinician without causing any trouble or pain to the patient (Ogle and Techniques, no date).

Rovin has designed certain scrutiny for biopsy (McGurk, 2019), (Patton, Epstein and Ross Kerr, 2008).

1. Lesions with no definitive cause lasting for more than 14 days
2. Inflammatory lesion that doesn't resolve after 10 -14 days even after the removal of the local irritating factor
3. Surface tissues with persistent hyperkeratotic changes
4. Any persistent swelling or growth palpable or visible under relatively normal tissue.
5. Any lesion which is inflammatory in origin persists for a longer duration of time.

6. Lesions which are related with local function. Eg. Fibroma.
7. Deep lesions associated with bones which are difficult to identify both clinically or radiographically
8. Lesions that show different features of malignancy: Erythroplasia, ulceration, induration, rapid growth, fixation etc.
9. Lesions which are unable to respond to any conservative treatment
10. To diagnose any lesions which give impression of a neoplasia

There are different types of biopsy procedures which include: 1. Incisional Biopsy 2. Excisional Biopsy 3. Exploratory Biopsy 4. Punch Biopsy 5. Curettage Biopsy 6. Unplanned Biopsy 7. Needle Biopsy 8. Imprint Cytology 9. Shave Biopsy 10. Fine Needle Cutting Biopsy 11. Exfoliative cytology

Incisional biopsy tests only a sample which acts as the representative of the lesion. It is usually done in lesions which are of larger size (> 1cm in diameter) or which have different features at different locations of the lesion or in lesions which are located at hazardous locations. In incisional biopsy a pie shaped or elliptical wedge is removed. Excisional biopsy is a procedure wherein the entire lesion is removed along with 2-3mm of surrounding normal structure. This is done to prevent the recurrence and ensure that the entire defective part is removed. It also helps in differentiating abnormal tissue from the normal one. It is advocated in cases where the lesions are smaller in diameter less than 1cm and the lesions on clinical examinations which appear to be benign (Patton, Epstein and Ross Kerr, 2008). FNAC (Fine needle aspiration cytology) is an easy, cheap and quick procedure that is used to test the lesions which are not very deep. It has no complications and causes very less trauma with rapid healing of the site. It is a sensitive and specific procedure for the lumps located in the head and neck region including the salivary and thyroid glands (Ahmad *et al.*, 2008).

There are no absolute contraindications for biopsy however the relative contraindications include: physiologic pigmentations like leukoedema, normal anatomic variations like exostosis, tori, medical conditions like history of diathesis, ongoing anticoagulant therapy, any proximity to vital anatomic areas, areas which are inaccessible etc (Patton, Epstein and Ross Kerr, 2008).

Recently there have been many developments in the biopsy techniques. Various advanced procedures are now carried out which have made biopsy taking very convenient (Pappa *et al.*, 1996). Our team has extensive knowledge and research experience that has translate into high quality publications (Kamisetty *et al.*, 2015; Patturaja and Pradeep, 2016; Felicita, 2017; Jain, 2017; Kumar, 2017) (Neelakantan *et al.*, 2011; Jain, Kumar and Manjula, 2014; Kamisetty *et al.*, 2015; Varghese *et al.*, 2015; Azeem and Sureshbabu, 2018). This study aims in evaluating the various intraoral biopsy procedures performed in a hospital setup in a year's time

## MATERIALS AND METHOD

Study design was that of retrospective type. The study was performed in a University setup in the southern part of India. Ethical approval was received from the Ethical research committee SIMATS Chennai.

Data extraction was done by reviewing the patient data bases of 86000 cases performed between March 2019- March 2020. Out of these 234 patients records who had a growth intraorally and require investigation for the same were acquired.

Descriptive statistics was used to evaluate the prevalence of the different biopsy procedures carried out during the 1 year. The correlation between the age and gender was done with the various types of biopsy procedures using Chi square test. Statistics were carried out using SPSS version 20 software.

Dependent variables included carcinoma, immunocompromised patients, smokers etc. Independent variables included patients with benign growth, intra oral swellings.

## RESULTS AND DISCUSSION:

Out of the total data extracted, 80.3 percent underwent incisional biopsy, in 17.5% excisional biopsy was carried out, 1.3% underwent FNAC procedures and 0.9% other biopsy techniques were performed (Figure 1). Maximum biopsy procedures were carried out between the age group of 40- 60 years. When the gender was taken into account more cases were found among the male population (Figure 3). Age had a positive relation with the type of biopsy performed when the Chi square test was done. P value 0.015 (Figure2) . Gender a negative correlation with the type of biopsy performed. P value 0.483 (Figure 3).

The materials which are required for biopsy are very basic such as syringe and needle for local anaesthesia, mirror, probe, toothless dissection forceps, mosquito forceps, scalpel handpiece and number 15 blade, scissors, periostome, separators, needle carriers and suture mounted needles. For bone biopsies gubia forceps, a chisel and mallet, a motor-

driven handpiece with drills, and curettes are used. In addition to this ejector, sterile gloves, cotton, gauze, 10 % formalin solution is required (Garcia Peñin *et al.*, 1987).

The type of biopsy technique advocated depends on the clinicians liking, the site where the lesion is located and the size of the lesion. Excisional biopsy is preferred when compared to the others. Austin et al in a study of melanoma related death reported a significant reduction of survival in 48 cases in which incisional biopsy was performed when compared to the excisional biopsy group (Nanda, Mehta and Nanda, 2012). Gandolfo et al concluded that diagnosis should always precede the treatment while treating any lesion. Depending on the size and site of the lesion, incisional biopsy must always be chosen and if necessary should be preceded by toloum chloride stain (Gandolfo *et al.*, 1993).

Paula et al in a study concluded that FNAB has a very high degree of success in making a final diagnosis. It shows a high sensitivity and specificity in identifying both benign and malignant lesions (Fierro-Garibay *et al.*, 2011; Santos *et al.*, 2011). For the lesions of unknown origin or cause, biopsy provides the most easy and quick means of getting an accurate diagnosis. For the patients well being it is very important to give a correct diagnosis. Here a careful handling of the tissue and immediate fixation will help in giving a proper histological diagnosis. Carelessness at any stage could result in a poorly diagnostic biopsy and will need repeating the procedure which can cause discomfort to the patient (Kumaraswamy *et al.*, 2012), (Fierro-Garibay *et al.*, 2011). Maximum biopsies were carried out in the older age group especially in males. This suggests that middle to older aged individuals were more prone to developing carcinoma especially in males. The data received is similar to the results seen in the study done by Franceschi et al (Franceschi *et al.*, 2000).

There have been very few retrospective studies which have been undertaken on the types of biopsy techniques performed (Lima *et al.*, 2008), Additionally there have been no studies that have evaluated the prevalence of different intraoral biopsy procedures undertaken. Our institution is passionate about high quality evidence based research and has excelled in various fields (Pc, Marimuthu and Devadoss, 2018; Ramesh *et al.*, 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai *et al.*, 2019; Sridharan *et al.*, 2019; Vijayashree Priyadharsini, 2019; Mathew *et al.*, 2020). We hope this study adds to this rich legacy.

Limitation of the data is the reduced sample size and the limited amount of data available of patients undergoing intraoral biopsies. This study has a geographical limitation as it is a University based study. Data was collected only for 3 types of biopsies specifically i.e incisional, excisional and FNAC whereas for the other types only a limited amount of data was present. It is necessary to carry out extended research of different types of biopsies. With the increasing awareness about the importance of minimal invasive techniques needed for the patient comfort and ease of the procedures future prospectus for the alternative therapies should be taken into consideration.

## CHARTS AND TABLES

Type of biopsy performed	Frequency	Percent
incisional	188	80.3
excisional	41	17.5
fnac	3	1.3
other biopsy types	2	.9
Total	234	100.0

Table 1: shows the prevalence of various types of biopsies performed in the study population. Maximum prevalence was in case of incisional biopsy (80.3 %) followed by excisional biopsy (17.15%). Rarely FNAC or other biopsy procedures were carried out.

Age	df	12
	P value	.015*,b,c

Gender	df	3
	P value	.483 <sup>b,c</sup>

Table 2: shows the association between age and gender with the type of biopsy performed using chi-square test. P values have been displayed in the table. P value < 0.05 (0.015) for age signifying that age has a positive correlation with the type of biopsy performed where P value for gender is > 0.05 (0.483) signifying that gender has a negative correlation with the type of biopsy performed.

Age range	Type of biopsy performed				Total
	incisional	excisional	fnac	other types of biopsy	
10-20	3.2%	12.2%	0.0%	0.0%	4.7%
21-30	27.1%	34.1%	0.0%	0.0%	27.8%
31-40	48.4%	31.7%	66.7%	100.0%	46.2%
41-50	18.6%	22.0%	0.0%	0.0%	18.8%
51-60	2.7%	0.0%	33.3%	0.0%	2.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Table 3: This table shows the different types of biopsies performed in different age groups. The table reveals that maximum number of biopsies were carried out in the age group of 31 to 40 years, particularly incisional biopsy (48.4%). This was followed by the age groups between 21 to 30 and 41 to 50 respectively. This suggests that patients lying in the middle and older age groups mostly underwent biopsy procedures.

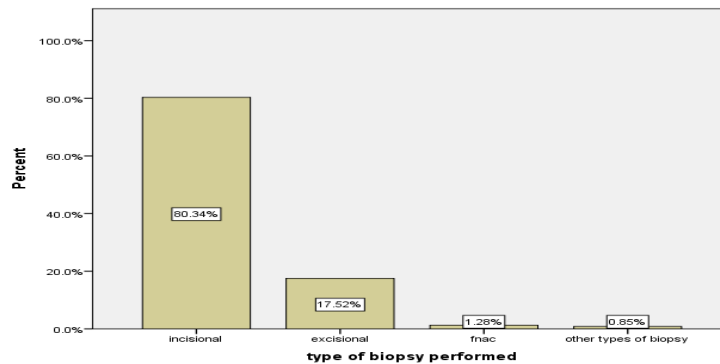


Figure 1- This bar graph represents the percentage of different types of biopsy techniques carried out in the patients. The x axis shows the type of biopsy technique used. The y axis shows the frequency percentage of the biopsy technique used. This graph reveals that the maximum number of biopsy procedures performed on the study population consisted of incisional biopsies 80.34% followed by excisional biopsies 17.52%. Very few FNAC procedures were carried out.

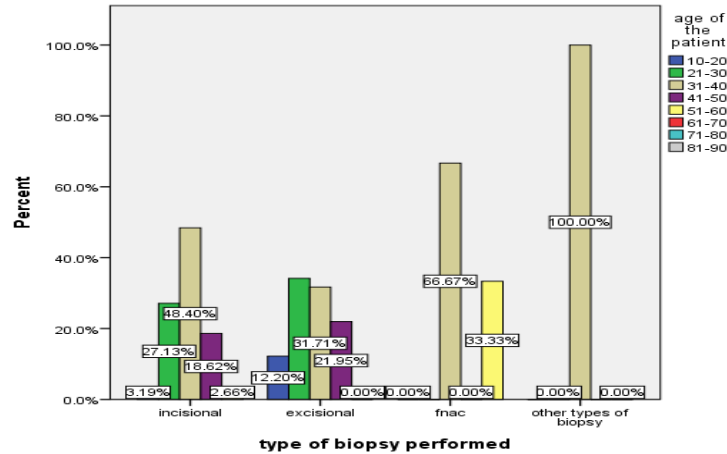


Figure 2: This graph shows association between different types of biopsy performed with different age groups. The X axis depicts the different types of biopsy procedures performed, the Y axis depicts the frequency percentages of the various procedures undertaken. The dark blue colour depicts the age group from 10 to 20, green colour depicts the age group from 21 to 30, the beige colour depicts the age group from 31 to 40. The purple colour depicts from 41 to 50. Yellow colour affects the age group from 51 to 60. Red colour depicts age group from 61 to 70. Light blue colour depicts the age group from 71 to 80. Around 48.40% of the population undergoing incisional biopsy lied in the age groups of 31 to 40. Excisional biopsy was performed more commonly in the age group between 21 to 30 years (31.71%). FNAC and other types of biopsies were mainly performed in the age group of 31 to 40. There was a statistically significant association between age and the type of biopsy performed. (Chi square association value - 0.015).

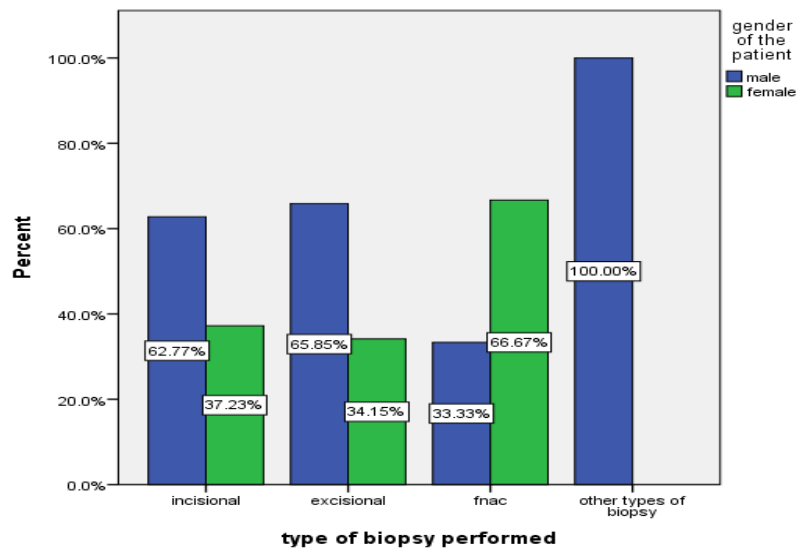


Figure 3: The bar chart displays the association of different types of biopsies performed with the gender of the patient. The X axis shows the different types of biopsies carried out in the study population. Blue coloured bars represent male patients and green coloured bars represent female patients. The Y axis shows the frequency percentage of types of biopsy techniques used. It reveals that incisional (62.77%) and excisional biopsies (65.85%) were performed mainly in males. On the other hand FNAC procedure was performed mainly in females accounting for 66.67% of the total population. The association between gender and the type of biopsy performed was not statistically significant. (Chi square association value - 0.483).

### CONCLUSION:

Within the limitation of the study, it can be concluded that Incisional biopsy was the most commonly performed type of biopsy. Age had a positive correlation with the type of biopsy performed. Gender did not have a significant

correlation with the type of biopsy performed. Maximum biopsies were carried out in the older age group especially in males.

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**Author contributions:** Author 1- Harsh Kasabwala carried out the study by collecting the raw data handwriting the manuscript with the necessary statistical analysis. Author 2 -Dr Subhabrata Maiti and Author 3- Dr Kiran Kumar helped in guiding the study and supervised the statistics.

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