

Annual Audit Of Cases Received In Oral Pathology Laboratory Services

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KEYWORDS:	ABSTRACT:
Annual audit, oral pathology laboratory, laboratory services, reference source, type of biopsy specimen, biopsy site, male to female distribution, histopathological diagnosis, use of immunohistochemistry and special stain	Biopsies are often essential for the definitive diagnosis of oral and maxillofacial lesions and are an integral part of the diagnostic process in histopathology labs. Currently, there is a lack of research on auditing oral histopathology services. Case audits, which utilize data from patient records and laboratory information systems, analyze case volumes and diagnostic accuracy to correlate clinicopathological findings. This study aims to analyze the cases received by the oral pathology lab from January 1 to December 31, 2021, and to compare clinical aspects with histopathological examination findings. Data were retrieved and analyzed from all biopsy and cytology reports submitted to the oral pathology laboratory in 2021, different parameters were assessed. Among the total number of 701 cases reported in 2021. The following types of specimens were received: cytology 27(3.8%), incisional biopsy 399(57%), and excisional biopsy 275(39.2%). The male-to-female ratio was 2:1. The cases included referrals from oral and maxillofacial surgery (513 cases), private practices (76 cases), oncology (51 cases), and others (51 cases). The locations of the lesions were as follows: maxilla 288(40.9%), mandible 317 (45.1%), and both maxilla and mandible 96(13.7%). It also highlighted issues such as inadequate biopsy specimens, non-representative tissues, and insufficient documentation.

INTRODUCTION:

Biopsies are often required for a definitive diagnosis of oral and maxillofacial lesions and are part of the diagnostic process carried out in histopathology labs. There isn't much research available right now on the audit of oral histology services. The purpose of this study was to determine how often oral lesions were biopsied within a certain facility. Furthermore, to monitor the utilization of the oral pathology service and identify any potential issues with the oral histopathological diagnosis service helps identify opportunities for resource optimization, such as improving diagnostic procedures or judiciously assigning laboratory staff and equipment[1]. Because case audits provide several benefits that include patient care, professional development, compliance, diagnostic accuracy, and resource management, they are an essential component of quality control in an oral histopathology department[2]. A vital component of professional development and regulatory compliance, auditing oral histopathology services also improves diagnostic precision and patient care. Successful audits support policy changes, highlight best practices within the department, and uncover service delivery shortcomings[3]. This also gives pathologists and lab personnel the chance to pursue ongoing education and training, allowing them to stay up to date on the most recent advancements in diagnostic approaches[4].

Furthermore, by identifying areas where resources may be misused or underutilized, routine audits can support the laboratory's sustainability and cost-effectiveness. Audits help to better manage workflow, provide timely reports, and enhance patient outcomes by methodically examining every facet of laboratory operations, from specimen collection to final diagnosis[5]. They are therefore essential for upholding the highest standards in oral histopathology services and guaranteeing that the laboratory can adjust to changing clinical requirements[6].

The main focus of laboratory auditing is the routine aspects of the department's work, and it serves as a channel for feedback between users and laboratory staff. Examining the following area of laboratory auditing may be of interest to a diagnostic pathologist[7]. The audit process commences with the audit creating an audit checklist based on the quality system manual of the organization that is being audited[8]. In an audit, necessary standards are complied with, their application is evaluated, and remedial measures are offered to raise the standard of performance. Both minor and big organ resections are included in surgical histology[9]. Improved overall performance and improved patient care are possible with a surgical histopathology laboratory audit[10].

MATERIALS AND METHOD:

This retrospective study was conducted at Saveetha Dental College and Hospital, Chennai, in 2021. It involved reviewing and extracting data from all biopsy and cytology reports submitted to the Department of Oral Pathology throughout the year. Patient data, including case referrals, types of specimens received, biopsy sites, male-to-female incidence, diagnostic classifications, and the use of immunohistochemistry (IHC) and special stains, were collected from the institution's dental information archive system. The data were entered into Microsoft Excel for calculation of percentages and further tabulation using online software.

Lesions were classified into four major categories: Neoplastic, Non-Neoplastic, Non-Specific, and Others(Table1), which were further divided into 12 subgroups: malignant epithelial tumors, odontogenic pathology, oral potentially malignant disorders, reactive lesions, fungal and protozoal pathology, epithelial-lined cysts of the jaw, salivary gland pathology, pulp and periapical pathology, soft tissue tumors, epithelial pathology, non-specific lesions, and others(Figure 5). The study also included complex cases requiring immunohistochemistry and special stains for accurate diagnosis. Descriptive analysis was carried out using SPSS software.

RESULTS:

During the course of the investigation, which lasted a year, 701 cases were reported. Of those, 513 (73.2%) came from oral and maxillofacial surgery, 85 (12.1%) from private clinics, and 51 (7.2%) from the oncology department. 16 cases (2.2%) related to periodontics, 23 cases (3.2%) involving oral medicine, 8 cases (1.1%) involving oral biology, and 2 cases (0.2%) involving other specialties like pedodontics and the public health department were present(Figure 1). Incisional biopsy (56.8%), excisional biopsy (39%), cytology (3.8%), and others (0.4%) were the specimen types received(Figure 2). The male to female ratio is 2:1(Figure 4). The mandible accounted for 45.1% of the lesion site, followed by the maxilla at 40.9% and both maxilla and mandible at 13.7%(Figure 3).

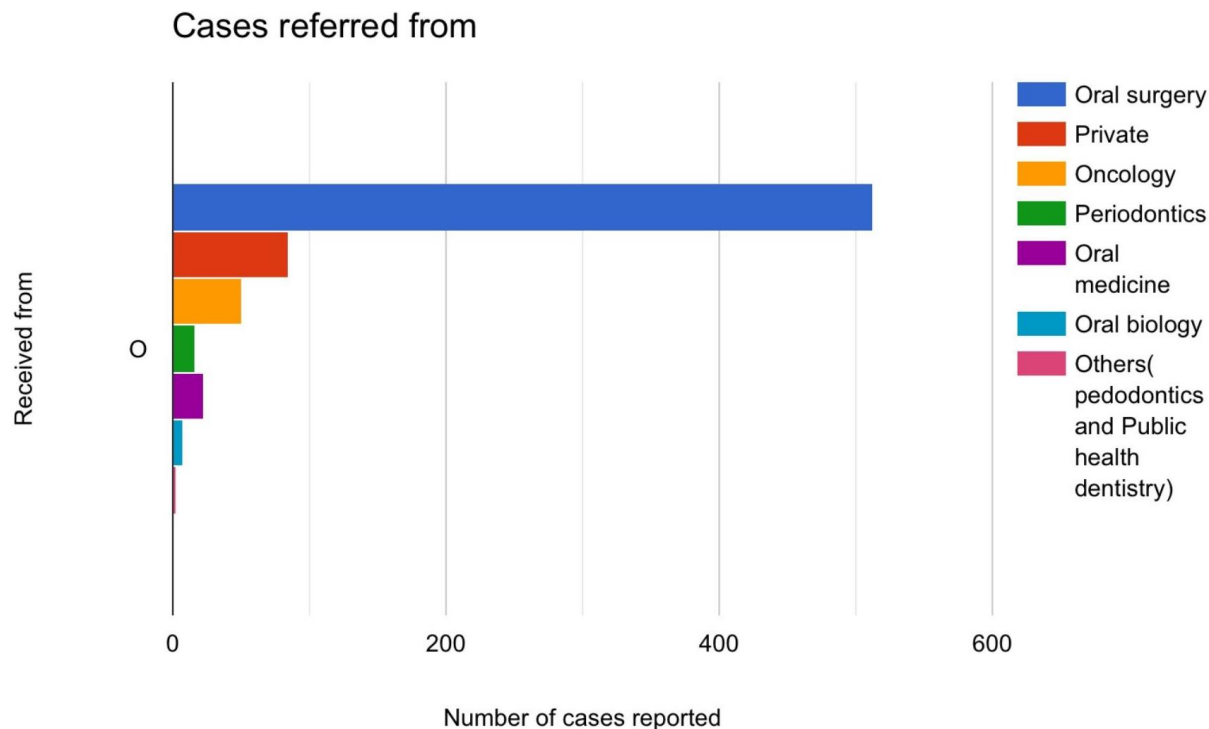


Figure 1: Indicates cases received from various sources (i.e In patient and via private clinics).

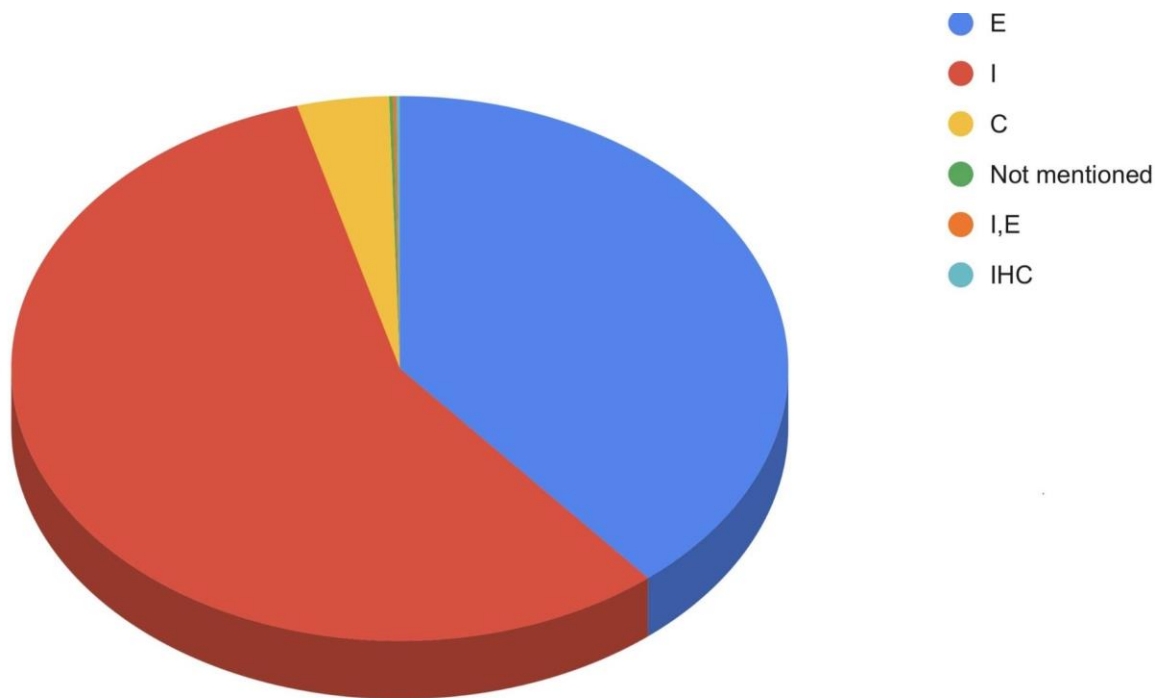


Figure 2 : Showing graph on the type of specimen received.

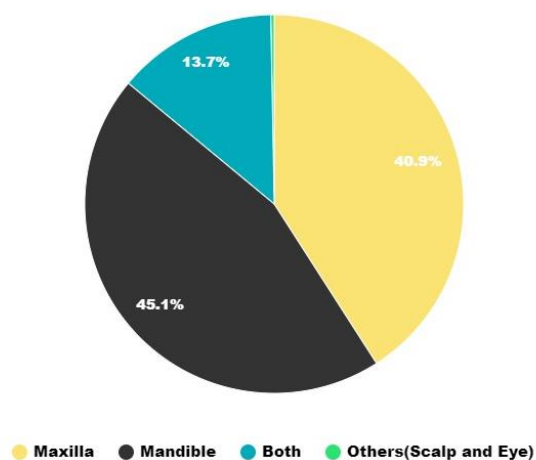


Figure 3: Represents the site of biopsy

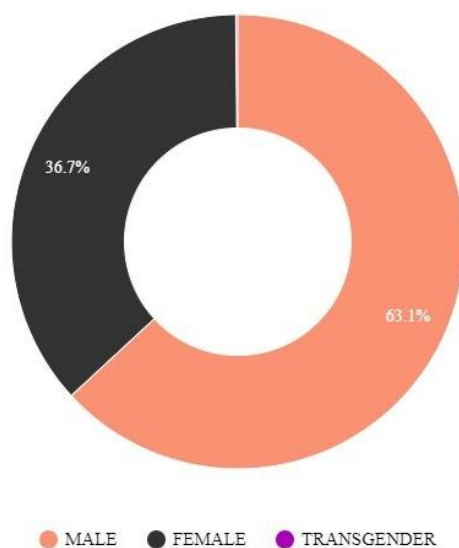


Figure 4: Indicates male to female percentage.

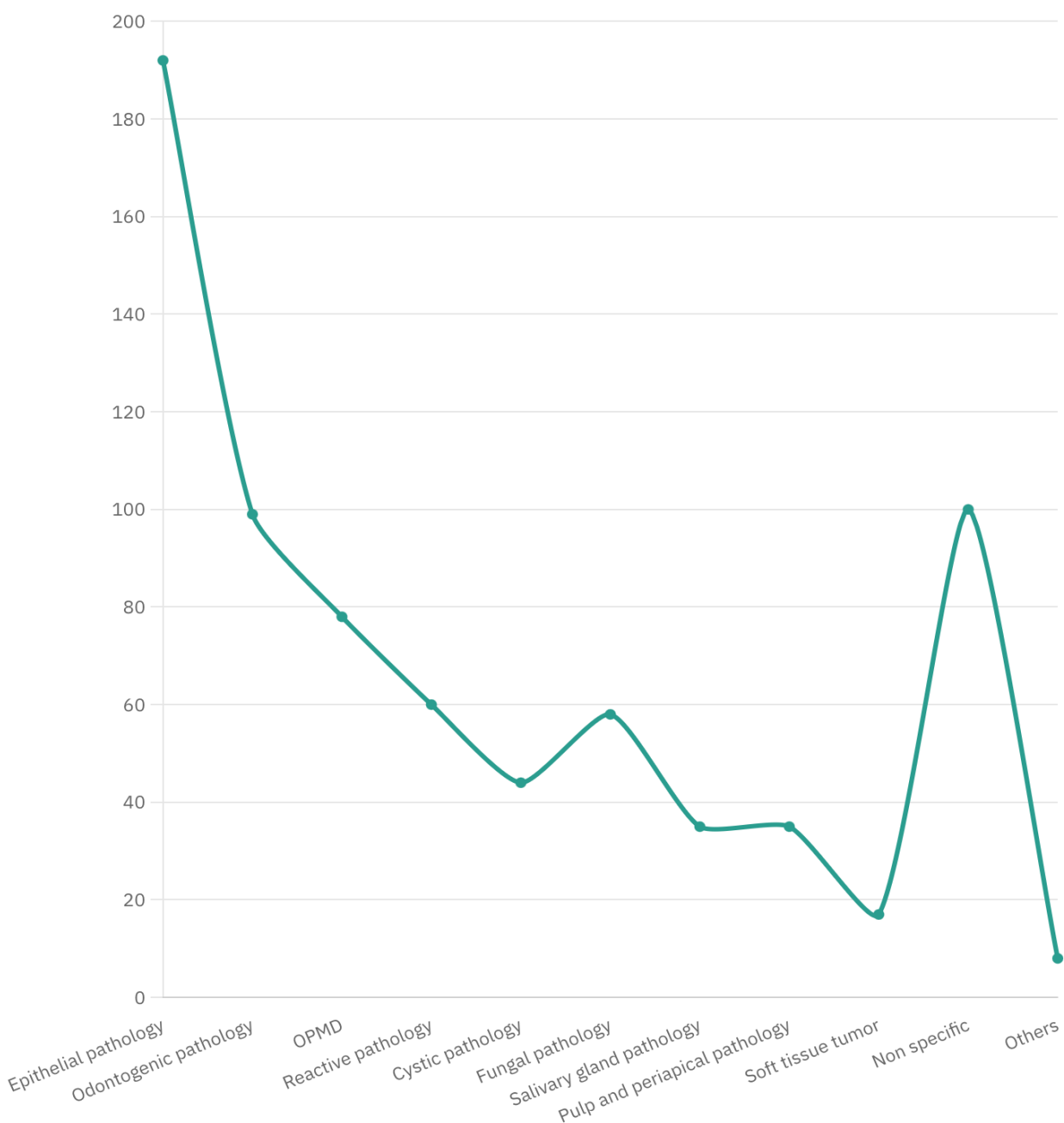


Figure 5 : Line graph showing various pathologies reported in x axis and number of cases reported in Y axis

	INCIDENCE	PERCENTAGE
NEOPLASTIC	343	48.9%
NON NEOPLASTIC	180	25.6%

NON SPECIFIC	100	14.2%
OTHERS	79	11.3%

Table 1: Wide classification of cases reported in a period of time.

STATISTICAL ANALYSIS:

While considering age and gender and correlating it with histopathological diagnosis with chi square test, to identify the p value and correlation. Age and gender shows p values less than <0.005 (i.e: both showing significant values). Age shows p value of 0.00 and even gender shows p value of 0.00.

DISCUSSION:

The frequency of biopsied oral lesions has been the subject of reports in the literature[5][6], and the prevalence of oral biopsies across various anatomical regions and groups has also been determined by others[7][8]. In this investigation, compared to earlier studies, a comparatively smaller number of biopsies were sent for histopathological diagnosis during the study period[5]. Although Oliveira e Silva et al. and Ali et al. reported 13,522 and 3,150 requests over a 10-year study period, respectively, over a 24-year study period, our study recorded 701 requests within a year period[5][6].

The distribution of 701 instances that were reported over a one-year period reveals important trends in the frequency and causes of patient problems across different dentistry and medical professions. Because of the intricacy and invasiveness of the procedures, it is possible that the oral and maxillofacial surgery department has the highest incidence or discovery rate of issues, as evidenced by the majority of cases (73.2%) that came from this department. The noteworthy percentage of instances from cancer departments (7.2%) and private clinics (12.1%) suggests that these settings also encounter considerable patient management difficulties, perhaps because of their patient demographics or specialized character. On the other hand, fewer cases from specializations such as oral biology, periodontics, and oral medicines indicate a lower volume of critical incidents or less frequent reporting in these domains. Comprehending this distribution is essential for a study because it shows where the most critical problems arise, allowing for focused enhancements in patient care, resource distribution, and specialized training to improve outcomes in all dental and medical practice areas[11][12].

The information on lesion sites, specimen kinds, and the male-to-female ratio provide light on the clinical traits of the patients under investigation. The majority of cases (56.8%) involved incisional biopsies, which indicate that most tumors were too big or complex to be completely removed, emphasizing the necessity for additional diagnostic evaluation. Excisional biopsies (39%) show that a considerable proportion of lesions were sufficiently tiny and controllable to be excised completely. With a male-to-female ratio of 2:1, the majority of cases are male, which raises the possibility of a gender difference in the prevalence or detection of oral lesions. Given that the maxilla and mandible account for 40.9% and 45.1% of lesions, respectively, these regions are especially prone to diseases that necessitate biopsies. In order to detect trends, risk factors, and possible areas for targeted diagnostic, therapeutic, or preventative strategies, which could eventually improve patient outcomes in oral health care, this data is crucial to the study. It gives a thorough overview of the clinical landscape[13].

According to the data, there is a considerable load of potentially malignant disorders, with nearly half of the cases (48.9%) being neoplastic. Reactive or benign diseases are significantly present, as seen by the 25.6% non-neoplastic instances. 14.2% of cases are recognized as "non-specific," indicating difficulties in making accurate diagnoses. 11.3% of cases are in the "others" group, which includes less frequent disorders. This dispersion highlights the necessity of targeted diagnostic approaches and customized treatment plans in order to adequately address the wide spectrum of diseases.

Prevalence of various pathologies found in the study, with odontogenic and epithelial pathologies being the most prevalent, may suggest that these illnesses bear the greatest burden among the patient population[10][14]. Although the continuous drop in other categories such as reactive pathology, cystic pathology, and potentially malignant disorders (OPMD) suggests a lower prevalence, their presence still calls for clinical notice and action. A considerable proportion of instances may not fit into recognized diagnostic categories, as shown by the apparent surge in the "non-specific" category. This would highlight the need for additional research and the need for diagnostic criteria to be refined. This audit is essential because it helps determine the most common pathologies, directs the distribution of resources, enhances diagnostic procedures, and molds clinical practice to handle the most common or difficult conditions[15]. Moreover in this period of this fungal pathology like mucormycosis was in its peak due to the covid pandemic situation.

To help with a correct diagnosis, IHC was done on 27 cases and special staining was done on 24 cases. The most used IHC technique is Kiel 67, also referred to as "ki67," and the most often used special stain is Periodic Acid Schiff Stain. Fewer data had the incorrect patient ID, and some were unverified. The majority of those files were recovered using manually annotated registries and Dias (Dental Information Archival System). Inconsistent audit results stemming from differences in the interpretations given by several pathologists may affect the reliability of findings[16]. Audits may focus on specific aspects of diagnostic work while potentially overlooking other important components, such as communication of results, lab protocols, and specimen storage[17][18]. Ensuring accurate and thorough documentation of all cases and audit findings can be challenging, especially in labs with inadequate record-keeping systems[19][20]. By guaranteeing diagnostic precision, consistency, and adherence to best standards, an oral pathology case audit directly enhances patient care and results[21][22]. Error detection, consistent diagnostic standards, and early problem detection for prompt actions are all facilitated by it[23]. Additionally, these audits function as teaching tools, offering professionals opportunities for learning and criticism[24]. They also make sure that the law and ethical standards are followed, which lowers medico-legal risks and boosts confidence in pathology practices²². Audits ultimately enhance professional growth and clinical efficacy[25].

CONCLUSION:

By identifying error patterns, audits facilitate remedial action by reducing the likelihood of recurring errors and enhancing overall diagnostic reliability. Furthermore, case audits aid in research and development by offering direction for next advancements through their systematic information collection and detection of fresh patterns. They increase patient safety and satisfaction by ensuring high standards of care. Additionally, they optimize resource management, leading to more efficient and cost-effective operations. A crucial part of oral pathology quality control, case audits provide a number of benefits that improve patient care, professional growth, accuracy of diagnosis, and resource use. Applying artificial intelligence and machine learning to enhance diagnosis accuracy, assist with case reviews, and identify trends that human reviewers might miss. Installing digital pathology tools to facilitate remote evaluations, second opinions, and quicker access to historical data.

Conflicts of interest:

In compliance with the ICMJE uniform disclosure form, all authors declare the following.

Payment/services info: All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work.

Author's contribution:

Vimalasubhashini Vivekbalamithran - Develop the concept, Designing of manuscript, Investigation, Data collection.

Pratibha Ramani - Supervision, Develop the concept, Resources

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