INTRODUCTION

Histopathology comprises routine laboratory work associated with pathology specimens that includes mainly grossing and microscopic examination. Of the two, microscopic examination of the specimen seems to be the favored option, as it is pleasing to the eyes, requires less manual work, and is not associated with any occupational hazard since it does not involve handling of chemicals. However, to aid in appropriate and accurate microscopic examination, grossing of tissue is the most crucial step.

It is grossing that gives an idea about the size, form, and nature of the process both in structural and clinical context. Moreover, for many, grossing is merely a technical step and the smaller the specimen, less significant is this step. This step is usually neglected and may often lead to inappropriate and inaccurate microscopic examination, but improper grossing cannot be tolerated as information lost during grossing is lost forever.

Proper identification and orientation of the specimen is imperative for microscopic evaluation. If difficulties are encountered while orientation of the specimen, imaging of the specimen could be of help. Imaging may include digital photography, stereomicroscopy of the specimen, and even radiographic examination. Stereomicroscopic examination of the specimen can aid and give us some vital clues regarding the nature, type of proliferation (papillary, mucosal or submucosal, presence of epithelium or capsule) which would not only aid in proper orientation of the specimen but also in diagnosis. Thus, the aim of the present article was to assess the effectiveness of stereomicroscopy in routine laboratory procedures.

MATERIALS AND METHODS

The archives of the Department of Oral Pathology and Microbiology were reviewed from 2010 to 2013 and all the cases in which stereomicroscopy was used as an aid for receive different tissue specimens varying from small biopsies to complete resected specimens.

During grossing proper dissection, gross description, diagrams with measurements of specimens, selection of proper specimen, and orientation of tissues for embedding are the most important step. All these steps should be done precisely because an inadequate microscopic description of the tissue can be reviewed again, but improper grossing cannot be tolerated as information lost during grossing is lost forever.

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study of the dissected specimen were retrieved. Information regarding the gender and age of the patient, site, size, and duration of the lesion, grossing details, and final diagnosis were obtained from the case records [Table 1].

**Study material**

**Case 1**
A 25-year-old female patient reported with a chief complaint of swelling on the palate since 1 year. The swelling extended from the rugae area to the 1st molar on the left side. The swelling did not cross the mid-palatine suture. Radiographically, a unilocular radiolucency was seen in association with the grossly carious first molar. Excision was performed. We received a single piece of tissue. On stereomicroscopic examination, we could see a lumen with few irregular proliferations into the cystic cavity. A fibrous capsule of varying thickness was also seen with area of brownish discoloration which could be suggestive of hemorrhagic area. On grossing, this was suggestive of a cystic lesion [Figure 1a]. On microscopic examination, it was confirmed as radicular cyst which was lined by epithelium over an inflamed connective tissue stroma. A thick capsule was also seen around the stroma [Figure 1b and c].

**Case 2**
A 54-year-old female patient reported with a chief complaint of a growth on the left buccal mucosa. The growth was present since 6 months and was present along the line of occlusion. Excision was performed and we received a single piece of tissue. The tissue was cut in the center for proper orientation. On stereomicroscopic examination, we could see a thin capsule/epithelium surrounding the central fibrous tumor component [Figure 2a]. On microscopic examination, flattened stratified squamous epithelium overlying a dense fibrous connective tissue stroma composed of densely arranged collagen fibers was seen suggestive of fibroma [Figure 2b and c].

**Case 3**
A 60-year-old male patient presented with a chief complaint of burning sensation of mouth. On intra-oral examination, a white patch was seen on the buccal mucosa extending from the area opposite the second molar tooth to the retromolar region.

**Table 1: Clinicopathologic details of included cases**

| Case no | Age/sex | Clinical presentation | Stereomicroscopic examination | Histopathological findings | Final histopathological diagnosis |
|---------|---------|-----------------------|-------------------------------|---------------------------|----------------------------------|
| 1       | 25 years/F | Swelling on the palate since 1 year | A lumen with few irregular proliferations into the cystic cavity | Cystic cavity lined by epithelium over an inflamed connective tissue stroma. A thick capsule was also seen around the stroma | Radicular cyst |
| 2       | 55 years/F | Growth on the left buccal mucosa since 6 months | A thin capsule/epithelium surrounding the central fibrous tumor component | Flattened stratified squamous epithelium overlying a dense fibrous connective tissue stroma composed of densely arranged collagen fibers was seen suggestive of fibroma | Fibroma |
| 3       | 60 years/M | A white patch was seen on the buccal mucosa | A whitish keratotic surface epithelium and a connective tissue | Hyperkeratotic stratified squamous epithelium of varying thickness overlying a loose fibrous connective tissue stroma | Hyperkeratosis |
| 4       | 5 years/M | Lesion on the gingiva in relation to the first and second molar | A thick epithelium and connective tissue stroma which had a white and slimy appearance | Pseudoepitheliomatous hyperplastic epithelium overlying a loose to dense fibrous connective tissue stroma. Deeper stroma consisted of numerous stellate shaped fibroblasts | Myxoma |
| 5       | 35 years/F | A growth on the palate. The growth was pedunculated and was adherent to the underlying structures | Irregular papillary projections | Numerous papillary projections were seen lined with stratified squamous epithelium with a thin connective tissue extending up to the surface | Papilloma |
We received a single piece of tissue grayish white in color. On stereomicroscopic examination, we could see a whitish keratotic surface epithelium and a connective tissue [Figure 3a]. On microscopic examination, a hyperkeratotic stratified squamous epithelium of varying thickness overlying a loose fibrous connective tissue stroma was seen and was signed with the diagnosis as hyperkeratosis [Figure 3b].

Case 4
A 5-year-old child reported with a growth in the right posterior region. The lesion was present on the gingiva in relation to the first and second molar. The lesion was firm in consistency. We received a single piece of tissue which was brownish white in color. On stereomicroscopic examination, we could see a thick epithelium and connective tissue stroma which had a white and slimy appearance [Figure 4a]. On microscopic examination, pseudoepitheliomatous hyperplastic epithelium overlying a loose to dense fibrous connective tissue stroma was seen. Deeper stroma consisted of numerous stellate shaped fibroblasts. Features were suggestive of a myxoma [Figure 4b].

Case 5
A 35-year-old female patient visited the college with a growth on the palate. The growth was pedunculated and was adherent to the underlying structures. The lesion was excised and we received a single piece of tissue whitish in color and firm in consistency. On stereomicroscopic examination, irregular papillary projections were seen [Figure 5a]. On microscopic examination, numerous papillary projections were seen lined with stratified squamous epithelium with a thin connective tissue extending up to the surface. Features were suggestive of papilloma [Figure 5b].

DISCUSSION
Grossing involves evaluation of a pathological specimen and is an indispensable, but often neglected, component of complete pathological evaluation. “Grossing” is a term that refers to examination and dissection of surgical specimens with sectioning of tissues for microscopic evaluation.[1] Accurate diagnosis of tissues depends upon correct identification, handling, and processing of the received tissue. Hence, grossing becomes an important step in diagnosis of any pathology. An important step in grossing is identification of the area for proper embedding as this step is so critical in that improper orientation of the tissue can give a pathologist a hard time during reporting.
The findings in stereomicroscopy were correlating with the histopathological diagnosis. As in case 2, stereomicroscopic examination of the cut surface revealed the proliferating connective tissue tumor component with an atrophic overlying epithelium which correlated with the histopathologic features of a fibroma containing a surface epithelium which is frequently stretched and atrophic with a proliferating fibrous component [Figure 2a-c]. Similar findings were seen in case 4, as we could notice a proliferating connective tissue tumor component with a surface epithelium which was not atrophic as seen in case 2. Histopathologically, hyperplastic epithelium overlying a fibrous component was seen which was intermixed with stellate fibroblasts. In case 5, the gross examination of the specimen revealed tiny projections which were easily appreciated on stereomicroscope [Figure 5a]. On histopathology, a diagnosis of papilloma was given [Figure 5b]. Further, evaluation of all specimens in stereomicroscope as a part of routine grossing may help us to understand the surface morphology of the specimens better so that they could be correlated with histopathological findings. This would enable us to interpret the stereomicroscopic features of the specimen more objectively.
CONCLUSION

Grossing of tissue specimens received in pathology laboratory forms an important part of diagnosis. Accurate grossing, observation of the pathology specimen can give many clues that assist in final diagnosis. Aids in grossing like viewing the cut surface of the specimen under stereomicroscope provides us with additional information which could not only facilitate in orientation of the specimen but also in correct diagnosis. We would also want to expand our research with further use of stereomicroscopic for examination of all the tissue specimens received for histopathological diagnosis.

REFERENCES

1. Juan R. Rosai and Ackerman’s Surgical Pathology. 9th ed. Vol 1. New York: Mosby Elsevier; 2004. p. 25-9.
2. Paul EB, William EG. The gross room/surgical cutup. In: John DB, Marilyn G, Editors. Theory and practice of histological techniques. 6th ed. USA, Churchill livingstone; 2008. p. 75-6.
3. Roopa R, Premalatha BR. Grossing in Oral Pathology: General Principles and Guidelines. World Journal of Dentistry 2010;1:35-41.
4. Deepti S. A comparative analysis of microleakage of three root end filling materials-an in vitro study. Arch Orofac Sci 2008;3:43-7.
5. Stereomicroscope. Available from: En.wikipedia.org/wiki/Stereoscopic [Last accessed on 2014 Mar 20].
6. Rajendran R. Benign and malignant tumors of the oral cavity. In: Rajendran R, Sivapathasundharam B, Editors. Shafer’s Textbook of Oral Pathology. 5th ed. New Delhi, India: Reed Elsevier; 2006. p. 178-9.

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