Suture Thread Incisional Biopsy of Oral Tissue

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Abstract

Objective: To report a suture thread incisional biopsy technique performed on a 32-year-old patient with oral white lesion that resulted in a successful sample for histopathology.

Case report: A 32-year-old male reported to the outpatient dental clinic with the chief complaint of the appearance of painless white patches under his tongue. The patient had discovered the patches 3 months prior to his visit. Complete oral examination showed a 2 cm × 2 cm, non-scrapable white lesion on the floor of the mouth. An incisional biopsy was performed to confirm the provisional diagnosis of oral leukoplakia. Following a special technique, a suture needle and thread was inserted at a 90-degree angle along the tissue surface, followed by pulling the grasped tissue with the thread and cutting it with a size 15 scalpel blade. Hemostasis was achieved with single interrupted sutures. Macroscopic examination revealed a tiny wedge of oral mucosa with whitish surface and yellowish base measured 0.4 cm × 0.3 cm × 0.2 cm. Microscopic examination revealed a wedge of oral mucosa surfaced by stratified squamous epithelium. The final diagnosis was revealed to be mild dysplasia with hyperkeratosis.

Conclusion: The sample taken was found clear for the histopathological examination. The suture thread incisional biopsy technique was found to have many advantages over conventional incisional biopsy techniques. However, the procedure needs highly skilled clinicians to perform it. Further research is needed to better document more incisional biopsy cases using this technique.
Keywords

Oral Biopsy; Oral Histology; Surgical Technique; Oral Diagnosis

Introduction

Proper management of an oral mucosal lesion begins with diagnosis and the gold standard for diagnosing disease, oral or otherwise, is tissue biopsy. Incisional Biopsy (IB) is considered a dependable way of assessing the nature of oral lesions. The oral environment, which is moist and confined, poses challenges for collecting a viable tissue sample that will be suitable for diagnosis [1]. However, limitations of biopsy technique include potential sampling errors, insufficient tissue for diagnosis, presence of obscuring inflammation and other tissue artifacts excision. In addition, certain oral subsites are subject to diagnostic pitfalls that necessitate modifications of technique [2].

Technique

A 32-year-old male reported to the outpatient dental clinic with the chief complaint of the appearance of painless white patches under his tongue. The patient presented with chronic smoking with a pack a day history of more than ten years. The patient had discovered the patches 3 months prior to his visit. Complete oral examination showed a 2 cm × 2 cm, non-scrapable white lesion on the floor of the mouth as shown in Fig. 1.

The lesion however was not very conspicuous and needed a detailed examination to be revealed. Given the history of smoking and suspicious nature of the lesion it was decided to perform an incisional biopsy to confirm the provisional diagnosis of oral leukoplakia.

Figure 1: White lesion.
Discussion

Local anesthesia of mepivacaine 2% combined with epinephrine at a ratio of 1:100 000 was injected around the biopsy site. Following a special technique, a suture needle and thread was inserted at a 90-degree angle along the tissue surface, followed by pulling the grasped tissue with the thread and cutting it with a size 15 scalpel blade. Hemostasis was achieved with single interrupted sutures as shown in Fig. 2. The patient was advised with biopsy post-operative instructions and was placed on Ibuprofen 400 mg 3x daily for 3 days.

Figure 2: Post suturing.

Histopathology

Macroscopic examination revealed a tiny wedge of oral mucosa with whitish surface and yellowish base, measured 0.4 cm × 0.3 cm × 0.2 cm. Microscopic examination revealed a wedge of oral mucosa surfaced by stratified squamous epithelium. The epithelium exhibited irregular thickness, mostly thin, hypergranulosis and corrugated hyperkeratosis. In addition, the epithelium showed minimal to mild dysplastic change with focal area of moderate dysplasia. The basal cell layer was strikingly palisaded and exhibited focal basal cell hyperplasia. Other dysplastic changes included lower layer cellular crowding, enlarged nuclei and cells, large prominent nucleoli, increased N:C ratio, hyperchromatic nuclei and nuclear and cellular pleomorphism. The epithelial cytological atypia become more evident near the edge of the surgical margin. The dysplastic changes were confined to the lower third of the epithelium. The rete ridges are inconspicuous with flat epithelial and connective tissue interface.
Basal cell melanosis with underlying melanin incontinence, focal basal cell degeneration and subepithelial clefting were observed within the surface epithelium. The superficial lamina propria was infiltrated by dense band of lymphocyte (lichenoid pattern of inflammation). The base of the specimen composed of fatty tissue with variable size of blood vessels. The final diagnosis was mild dysplasia with hyperkeratosis. The patient was put on close follow-up protocol.

**Discussion**

Detection of abnormal oral mucosal changes begins with a thorough clinical examination, but the accuracy of the clinical impression is unreliable [3]. A histopathological exam via biopsy is the gold standard for definitive diagnosis; hence, any abnormal tissue discovered from a patient should be submitted for histopathological examination, irrespective of the clinical impression [4]. The dysplastic lesion or early oral cancer can present as a leukoplakia, erythroplakia, mixed white-red lesion, ulceration or as a mass [3]. A study involving 1003 oral lesions found exact concordance between clinical and histologic diagnosis in only 61% of cases overall [5]. Clinical exam was found to be accurate in identifying benign conditions in 95.9% of lesions, however it was only accurate in 66.7% of premalignant and malignant lesions [3,5]. Considering these findings, establishing a definitive diagnosis is only reliably accomplished after biopsy and histopathologic examination. Although an initial clinical exam may be unreliable in diagnosing premalignant lesions and oral squamous cell carcinoma, it is nonetheless an essential tool to recognize the need for a biopsy [6]. However, there might be discordance from oral IB to final pathology, with several studies relating the concordance with sampling error where the sampled tissue was not representative of the lesion [7-11]. Avon and Klieb describe the technique used for incisional biopsy as an elliptical incision made with a size 15 scalpel blade and the anterior tip of the ellipse is gently lifted with tissue forceps and the base is severed [1]. In the current case the researcher has modified this technique to use a suture needle with a thread instead. The suture thread is inserted around the biopsy site while rolling the thread around the lesion sample. Pulling the suture thread around the biopsy site makes it easier for the clinician to sever the needed tissue sample with no impact on the surrounding tissue as shown in Fig. 3-6. In addition, pulling the suture thread around the biopsy site has several advantages including less bleeding and infection, having a clean surgical area to work on, reducing patient discomfort, increased accuracy, flexibility and less time consuming performing the procedure. The technique however needs high skill and expertise to be performed, given the size of the needle and the nature of the oral surface, there is a possibility of losing the needle mid procedure if the clinician is not familiar with it. Eventually, the sample taken using this technique was found representative and viable for the histopathological examination [12].
Figure 3: Post suture removal.

Figure 4: Suture thread needle is inserted around the biopsy site.

Figure 5: The thread is rolled around the lesion.
Figure 6: The rolled thread is pulled and the tissue sample is severed using a size 15 scalpel blade.

Conclusion

The suture thread incisional biopsy technique was found to have less bleeding and infection provide a clean surgical area to work on, reduce patient discomfort, increase accuracy and flexibility, while consuming less time during the procedure. However, the procedure needs highly skilled clinicians to perform it. The technique was successful in obtaining a viable, representative tissue sample to facilitate histologic interpretation. Further research is needed to better document more incisional biopsy cases using this technique.

Conflict of Interest

There are no conflicts of interest.

References