

“Clinical Evaluation of Scalpel Blades Biopsy and Punch Biopsy of Oral Mucosal Lesion for Histopathology”

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Abstract

Background: Biopsy is a critical procedure in the diagnosis and treatment plan of surgical cases and is also highly technique-sensitive. Various biopsy techniques are conventionally used with each technique having its own pros and cons. A study was carried out to compare scalpel versus Punch for biopsy of oral lesions under various parameters vital to histopathological diagnosis. **Materials and Methods:** A total of 16 patients (08 in each group) satisfying the inclusion criteria were randomly allocated using odd-even scheme into scalpel and Punch groups by a operator. The patients were evaluated intraoperatively for patient comfort, bleeding, time taken for excision, and postoperatively for pain and healing. The excised samples were sent for histopathological analysis as follows: Loss of architecture in epithelium, loss of architecture in connective tissue and artifacts. **Results:** The mean time taken for excision was statistically similar in both the groups. Distribution of patient comfort and pain was statistically not significant. Healing was uneventful in both the groups. In the histological parameters, there was loss of architecture in epithelium in many cases in the punch group. In the same group, there was loss of architecture in the samples. **Conclusion:** Both techniques seem to be equally effective in performing incisional biopsies of oral lesions. Punch biopsy has the advantage of fast and avoidance of suturing as well. However, due to the Size of tissue caused, there may be minor loss of histological architecture.

Keywords: Biopsy, Histopathology, Punch biopsy, Scalpel biopsy, Oral Mucosa, healing.

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INTRODUCTION

Biopsy is described as the removal of tissue from live creatures for microscopic inspection and diagnosis. Biopsy is a Greek-derived term (bio-life; opsia-to see) roughly translated as "view of the living." Ernest Besnier first used the term "biopsy" in medical language in 1879 [1]. Abulcasim, an Arab physician, invented one of the first diagnostic biopsies (1103–1107AD). A goitre was punctured using a needle, and the material was analysed [2].

Biopsy is one of the most important procedures in any surgical specialty's diagnostic and therapy planning. The surgeon wants a rapid, painless surgery with minimal post-operative discomfort, the histopathologist wants a big, really representative, and undamaged specimen, and the patient wants a rapid, painless surgery with little post-operative discomfort [3].

Incisional and excisional biopsy techniques are the two types of biopsy techniques. Excisional biopsies are both diagnostic and therapeutic in that they remove

the whole lesion while leaving a normal tissue boundary around it. Incisional biopsies remove only a part of the lesion, usually together with neighbouring normal tissue, for the sole purpose of diagnosis, usually prior to the initiation of final therapy [4].

Scalpel biopsy, punch biopsy, electrosurgery, and laser biopsy are some of the biopsy procedures utilised in the excision of oral lesions [5].

Because of its low cost, ease of use, precision, and minimum injury to neighbouring tissues, the simple scalpel is still widely used. It does not, however, produce adequate hemostasis, which is crucial when operating on highly vascular tissues or other maxillofacial diseases. To establish a clear histological diagnosis or to examine a portion of the tissue, the complete biopsy specimen must be intact [5].

Punch biopsy is only used for definitive surgical excision of oral mucosal lesions, and the sizes of biopsy punches available range from 2 to 6 mm in diameter [6]. Incisional biopsies for diagnosis before therapy are most commonly performed using the oral mucosal punch biopsy method. Oral mucosal cancers such as squamous cell carcinoma, as well as leukoplakias and other mucosal abnormalities that may require several biopsies, can be treated using this approach [7].

Punch biopsy is particularly useful for detecting oral symptoms of mucocutaneous and other vesiculo-ulcerative illnesses. It is an accepted fact that microscopic analysis is the gold standard for the diagnosis of most lesions. It is important for the clinician to decide whether a lesion needs to be biopsied or not before treating it. With regard to oral soft tissues, any lesion in question, if persisting for more than 2 weeks even after the removal of the irritating factor (if any), biopsy should be performed. There are various types of biopsy technique are their every technique have their pros and cons and its indication where to use which one, it's all depends on its site, size, location, nature of lesion, patients factors, etc. so for this we have to assess the efficacy and effectiveness of scalpel blade biopsy and punch biopsy.

MATERIALS AND METHODS

The study was carried out with the following aims and objectives

To assess the effectiveness of the Punch versus the scalpel as a surgical aid in performing oral lesion biopsy, to assess the healing process after scalpel and Punch biopsy, to assess patient comfort after punch and scalpel surgery, and to analyse the histological parameters of the specimen obtained with each of these techniques. The research included patients who had benign intraoral lesions that required biopsy. The institutional ethics committee gave its approval for the study prior to its implementation.

A total of 16 patients (08 in each group) met the inclusion criteria and were randomly assigned to the scalpel or punch groups by an operator using an odd-even procedure to avoid bias.

Biopsies were obtained with a punch from oral lesions in Group I. The lead investigator treated each case under local anaesthetic and took a biopsy from the oral lesions using a scalpel biopsy according to established guidelines.

Sutures were implanted in 08 individuals after a scalpel biopsy. The biopsy of the lesion was done with a 4-0 punch in 8 individuals (Figure 1).

Visual evaluation of intraoperative bleeding in both groups and documentation of time consumed were used to measure the technique's efficacy. The patient's post-operative comfort was also noted. A visual analogue scale was used to evaluate pain after 24 hours (VAS). After one week, the healing process was evaluated. All of the aforementioned factors were evaluated by an impartial senior faculty member. The excised samples were sent for histological investigation, and several characteristics such as epithelial architecture loss, connective tissue architecture loss, and artefact presence were noted. The information gathered was tallied and statistically examined.

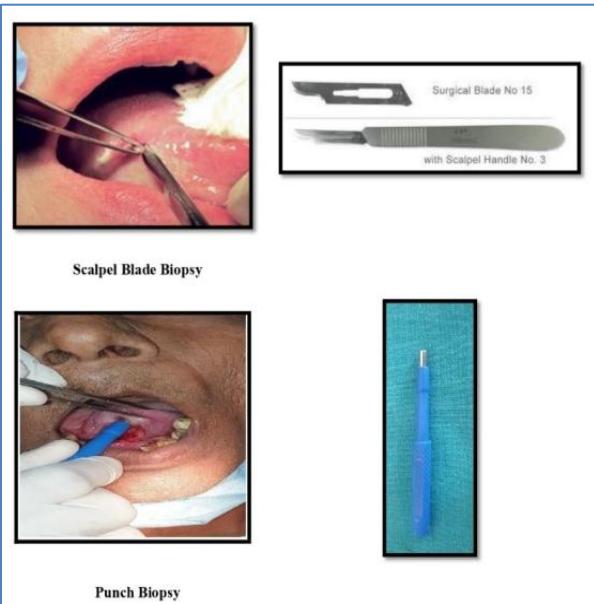


Fig-1: (a) Show Scalpel blade biopsy (b) Punch Biopsy

RESULTS

Statistical Methods

For a better understanding of the outcomes, the data was subjected to descriptive and inferential statistical analysis according to the groups that were originally allocated. Continuous measurement data are reported as mean standard deviation (minimum-maximum), whereas categorical measurement data are

reported as number (percent). The significance was determined at a 5% level of significance.

The significance of research parameters on a continuous scale between two groups (intergroup analysis) was determined using the Student's t-test (two-tailed, independent). The significance of research parameters on a categorical scale between two groups was determined using the Chi-square/Fisher exact test. The comparative results for effectiveness of scalpel versus Punch for biopsies of intraoral lesions are as follows:

Clinical Parameters

Intraoperative parameters [Figure 2]

1. Patient comfort - In Group I, 75% of patients had a VAS score of 2, 25% of patients with VAS score of 3. In Group II, 62.5% of patients had a VAS score of 2, 37.5% of patients had VAS score of 3 ($P = 0.618$).
2. Incidence of bleeding – somewhat bleeding is occur in both the group but in scalpel blade biopsy there is more bleeding as compare to punch biopsy. In Group I had bleeding during the procedure is mean around 3ml, whereas in scalpel blade biopsy it was 4.5ml bleeding in Group II ($P = 0.0486$).
3. Time taken - In Group I, time taken for the procedure in 50% of patients ranged from 5 to 7 min, in 37.5% of patients time taken ranged from 8 to 10 min, in 12.5% of patients ranged from 11 to 13 min. The mean time taken in Group I was 7.25 min. In Group II, time taken for the procedure in 12.5% of patients ranged from 5 to 7 min, in 50% of patients ranged from 8 to 10 min, in 37.5% from

11 to 13 min. The mean time taken in Group II was 11.25 min ($P = 0.111$).

Post-operative parameters

1. Pain - After 1 day, in Group I, 62.5% of the patients had a VAS for pain of 2, 37.5% had pain score of 4. After 1 day, in Group II, 75% of patients had a pain score of 2, 25% had a pain score of 4 ($P = 0.486$)
2. Healing - Healing was uneventful after 1 week in all the patients ($P = 1.000$).

Histopathological parameters [Figure 3]

1. Epithelium - In Group I, there was no distortion of epithelium in any of the specimen. In Group II, there was loss of architecture in the epithelium in 1 of the specimens.
2. Connective tissue – In both the Group no distortion of connective tissue in any of the specimens.
3. Artifacts – In both Groups no artifacts were present.

Other Parameters [Figure 3]

1. Type of lesion - in group I 12.5 % have benign in nature where as 87.5% have malignant in nature, in group II 25 % have benign in nature where as 75% have malignant in nature.
2. Site of biopsy – In group I 37.5% biopsy taken from buccal mucosa, 25% had from tongue and 37.5% had from gingiva and buccal vestibule region, In group II 62.5% biopsy taken from buccal mucosa, 12.5% had from tongue and 25% had from gingiva and buccal vestibule region.



Fig-2: (a) Distribution of patient comfort in the two groups studied, (b) bleeding in the two groups studied, (c) time taken in the two groups studied

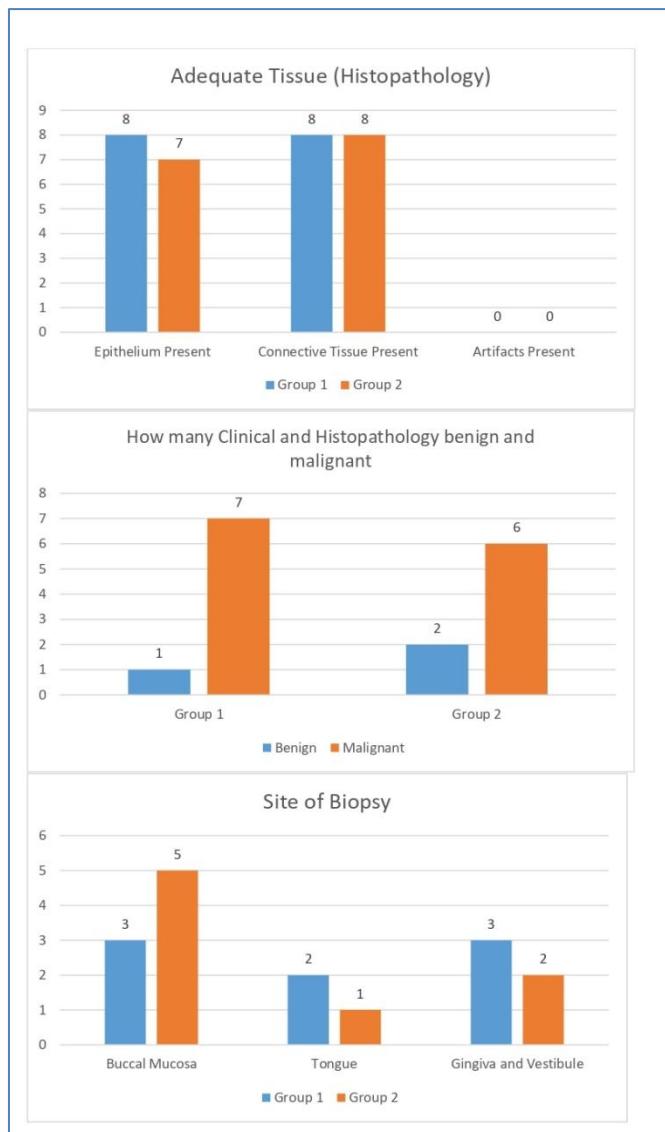


Fig-3: (a) Histological loss of architecture in epithelium, Histological loss of architecture in connective tissue, Histological artifacts in the two groups studied (b), Type of lesion (c) Site of biopsy

DISCUSSION

A wide range of oral mucosal lesions required definitive histopathologic evaluation. Diagnoses are made prior to the start of treatment. These lesions might be cancerous, reactive, or the oral mucosal manifestation of a more extensive conditions such mucocutaneous diseases. A variety of diagnostic surgical methods can be used to obtain adequate representative tissue for histopathologic examination.

On 16 individuals, a comparison of scalpel blade biopsy and punch biopsy of oral lesions was performed. Group I included eight patients who were punched and Group II included eight patients who were cut with a scalpel blade.

Both groups included patients between the ages of 18 and 60. In Group I, the average age of the patients was 36.55, whereas in Group II, it was 43.10. Both groups had statistically similar average ages.

Group I included 5 males and 3 females, whereas Group II had 5 males and 3 females.

Kashyap et al. found in his study 28 fibromas (14 in Group I and 14 in Group II), 8 mucoceles (5 in Group I and 3 in Group II), pyogenic granuloma (none in Group I and two in Group II), papilloma (one in Group I and none in Group II), lipoma (one in Group I and none in Group II) were among the lesions treated (none in Group I and one in Group II) [5].

In our study Out of 16 patients around 15 patients reported in our institute within one month of onset of lesion. Only one patient had a positive biopsy, and we had to redo the biopsy using the punch method. In the punch biopsy group, three patients were taken from the buccal mucosa, three from the vestibule and gingiva, and two from the tongue region, whereas in the scalpel group, five patients were taken from the buccal

mucosa, one from the tongue, and two from the vestibule area.

D Eisen conducted a research on 140 individuals in which 78 specimens were obtained from the buccal mucosa, 12 from the upper lip, 14 from the lower lip, 25 from the tongue, and 11 from the gingiva and vestibule area [8]. With a P value of 0.489, the distribution of diagnoses was statistically comparable in both groups. A visual analogue scale was used to assess patient comfort. In both groups, there was no significant difference in intraoperative pain. Patients in the scalpel group, on the other hand, complained of pricking during suturing.

In a research done by Dhabekar et al. in 2010, post-operative discomfort was decreased in Punch biopsy as compared to traditional surgical procedures [9]. Scalpel biopsy and laser biopsy findings indicated comparable results in a research done by Dhabekar et al. in 2010. [10] Only the scalpel group had bleeding.

The two groups' average times were compared. Only once the effect of local anaesthetic was established was the time took measurement recorded. The commencement time was determined from the first scalpel incision and the first punch contact. The final timings were complete suturing with the scalpel and removal with the punch. Suturing was not necessary in the punch group since there was little bleeding. The scalpel was faster at cutting than the punch, although suturing took a little longer. In both groups, the mean time needed for the surgery was statistically insignificant ($P = 0.111$).

In compared to the scalpel, which needed a thorough method and suturing at the conclusion, Yagüe-García et al. found that the entire treatment time with laser was less. Similarly, we found that the punch biopsy group took less time in our study [11]. All of the patients' pain levels were assessed on the first post-operative day. A visual analogue scale was used to assess pain. With a P value of 0.618, the difference in pain experience between the two groups was statistically insignificant. In a study comparing laser and scalpel biopsies, Baiju et al. found that pain at the laser-treated region was negligible after 24 hours, compared to considerable discomfort in the scalpel-treated group [12]. In our research, we found the same thing with the punch biopsy group.

The healing process was evaluated postoperatively based on clinical signs and symptoms. Pain, induration, or pus discharge from the biopsy site, among other things, was taken into account. Granulation development was seen on both scalpel biopsy wounds and the punch biopsy site, acting as a natural infection barrier. In any of the instances, there was no evidence of infection or wound dehiscence. With a P value of 1.000, all cases of healing were

uneventful. Following both procedures, there is ongoing extravasation of blood and lymph fluid into the incision, resulting in increased edema and inflammatory responses. This is why the resolution period is so long [10].

Almost 80% of the patients who had a biopsy had a malignant lesion, with only three patients out of 16 having a benign lesion.

In the punch biopsy group, two patients had biopsy obtained from numerous sites of the lesion, whereas in the scalpel group, only one patient had biopsy obtained from several sites of the lesion. All other patients' biopsies were collected from a single location.

The main disadvantage is that mending takes longer, which must be mentioned to the patient. When contrasted to scalpel wounds, which typically heal in a week to ten days, punch wounds can recover fully in as little as one week [13].

The epithelium, connective tissue and presence of artefacts were all examined histologically. As a result, for the better. To ensure that the pathologist is completely free of doubt and does not misunderstand the histological image, it is advised that the incision be kept slightly beyond the borders of the suspicious lesions [14]. The epithelium's histological image was normal in all Group II samples, but there was considerable loss of architecture in Group I. This might be due to the Punch size.

The ability to diagnose the lesion by histology is comparable in both groups. The diagnosis of the lesion does not change much.

With a P value of 0.001, this loss of epithelial architecture was statistically significant. Following scalpel biopsy, histopathologic specimens show no evidence of epidermal damage [5]. These are cytological artefacts that make it difficult to interpret histological data, particularly when the cause of the lesion is unknown [15]. The connective tissues were normal in all of the samples from both groups, however there was loss of architecture in the Group I instances. With a P value of 0.001, the loss of architecture in connective tissue was statistically significant.

There were no artefacts in any Group. Curving of the specimen after storage in fixing solution may indicate careless handling and less than ideal specimen alignment. This can be avoided by putting the epithelium surface of the removed specimen on a tiny piece of cardboard before immersing it in the fixative. Crushing, bleeding, tissue splitting and fragmentation of the material can all result in artefacts.

CONCLUSION

Under the study's conditions, it appears that both techniques are equally successful in doing incisal biopsies of benign oral lesions. In the future, further research with a bigger sample size may be conducted to confirm these findings. Punch biopsy has the benefit of keeping a bloodless area, avoiding suturing, and having better post-operative complications.

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