

Incisional biopsy versus punch biopsy: a comparative study

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Abstract

The term biopsy means vision of life. Biopsies are done to diagnose a disease properly to plan the surgery and post operative outcome of the disease. Carl Reye and Johan Veit first described the surgical biopsy in 1870's. There are several types of biopsies like incisional, excisional, punch, brush biopsies etc. Here we present a comparative study on incisional and punch biopsy on 100 patients in Institute of Dental Sciences, Bareilly. Our results showed that Incisional techniques should preferably be performed on any atypical lesion. Punch biopsy is a quick and simple procedure and it is easy to perform in an outpatient department, requires a minimum of surgical equipment and no specific surgical skills. As compared to punch biopsy, in incisional biopsy all specimen used for histopathological diagnosis. Post operative complications were less in case of punch biopsy and defect was less in case of incisional biopsy. This study shows that efficacy of incisional biopsy is more as compared to punch biopsy.

Keywords: Biopsy, incisional, pathology

Introduction

The term biopsy is derived from the Greek word “bios” means life and “opsis” means vision. A biopsy is done to establishing the diagnosis which is based on the tissue obtained from the living organism with the purpose of examining it under microscope.^{1, 2} Virchow, the father of microscope pathology was first to emphasize the fundamental of biopsy technique and the value of this procedure in the diagnosis of malignant disease processes.³

Carl Reye and Johan Veit, first came to know the surgical biopsy in 1870's in the University of Berlin, they observed that 10 out of 23 females who had undergone surgery for cervical cancer actually turned out to have the disease. They concluded that biopsy is necessary to confirm the diagnosis of disease.⁴The oral lesions and diseases are well diagnosed by biopsy.⁵

Incisional biopsies include part of affected tissue along with normal tissue to show the relationship between normal and abnormal skin. Long thin deep incisional

biopsies are excellent where it can be applicable like on the lower extremities as they allow a large amount of tissue to be harvested with minimal tension on the surgical wound.^{6,7}

A punch biopsy is done with a punch biopsy forceps ranging in size from 1mm to 8mm. Punch biopsy forceps contains the blade, which is attached to a scissors like instrument and rotated down through the mucosa, submucosa and submucosal tissues to produce a cylindrical core of tissue. The common size used to diagnose most inflammatory skin conditions is the 3.5 or 5mm punch.^{8,9}

The aim of this study was to compare the number and type of handling artefacts, produced by the mucosal punch biopsy and the conventional incisional biopsy technique at the time of surgical removal of tissue and objectives of current study were to evaluate post surgical pain by means of visual analogue scale (VAS scale) and restitution of integument.

Material and methods

This study was conducted on patients reported in Department of Oral and Maxillofacial Surgery, Institute of dental sciences, Bareilly in duration of 3 months from Sep 2019-Nov 2019.

Biopsies were usually performed for 3 reasons that is to establish the diagnosis, to check its margins and ensure complete excision and to assess the effectiveness of therapeutic procedures on previously diagnosed neoplastic disease

All those patients were included in the study, those have any lesion that persists for more than 2 weeks with no apparent etiological basis, any inflammatory lesion that does not respond to the treatment, any persistent hyperkeratotic lesion or suspected as neoplasm, inflammatory changes of unknown causes that persists for long periods and lesions that interfere with function.

Systemically not well patients, acute, virulent, pyogenic infection or patients with vascular lesions were excluded from the study.

Procedure

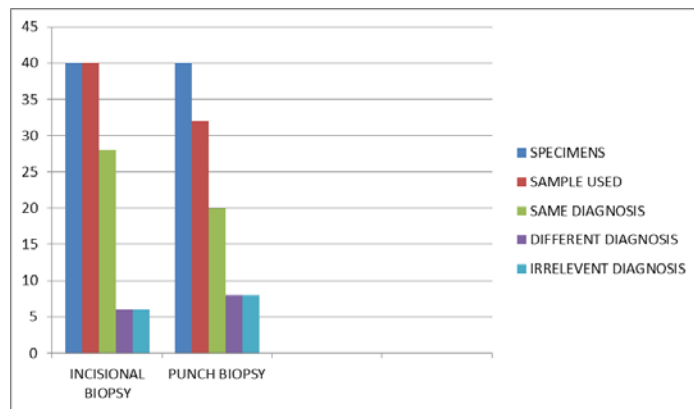
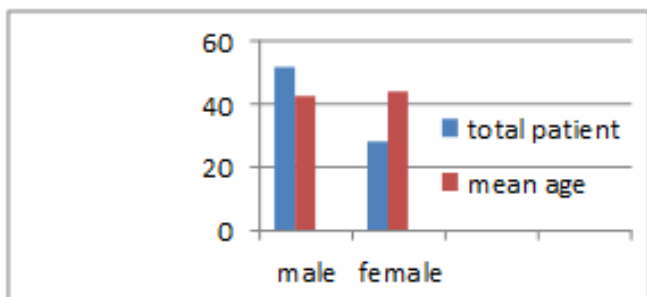
Punch biopsy: for punch biopsy, the armamentarium was arranged on surgical table as in fig 1 and the area of lesion was marked with surgical marker. The size of the biopsy should be approximately 2-6 mm according to requirement. Anesthesia was achieved and mucosa should be stretched to create the tension at lesion and mucosa. The diseased tissues along with the healthy tissue were held in the beaks of punch biopsy forcep and rotate the forceps to punch out the tissue (fig 1(A), (B) and (C)). The biopsy site was packed with betadine gauze. The sample as sent for biopsy in 10% formalin solution.

Incisional biopsy: for incisional biopsy, same as punch biopsy all the instruments were arranged as in fig 3 and the area of lesion was marked with surgical marker. The local anaesthesia was achieved for incisional biopsy. The mucosa was stretched and a wedge shaped incision was given involving diseased and healthy tissue for excision (fig 2(A), (B), and (C)). The excised tissue is sent for biopsy in 10% formalin solution and biopsy site was sutured to achieve hemostasis and packed with betadine gauze.

Results

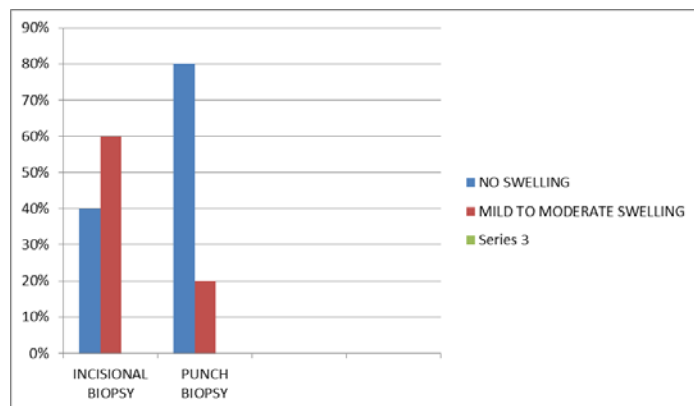
In this prospective case control study 40 incisional biopsies and 40 punch biopsies had taken randomly from patients reported to department of oral and maxillofacial surgery. All specimens were kept in 10% formaline, labeled and sent for histopathological report. In this study total 80 patients were included, in which 52 were male (65%) and 28 were female (55%). Mean age of patients were 43.6 years, mean age female were 43.75 years and male were 42.3 years.

	Total No of Patients	Mean Age
Male	52	42.3
Female	28	43.75



In comparison of post operative swelling after 48 hours, 40% cases of incisional biopsy did not have any swelling and 60% had mild to moderate swelling. In case of punch biopsy 80% cases did not have any swelling and only 20% cases have mild to moderate swelling. In a post operative follow up, 80% cases of incisional biopsy heals without any defect, 10% had slight defect and 20% healed by secondary intention. In cases of punch biopsy 50% cases healed without defect, 20% had slight defect and 30% healed by secondary intention.

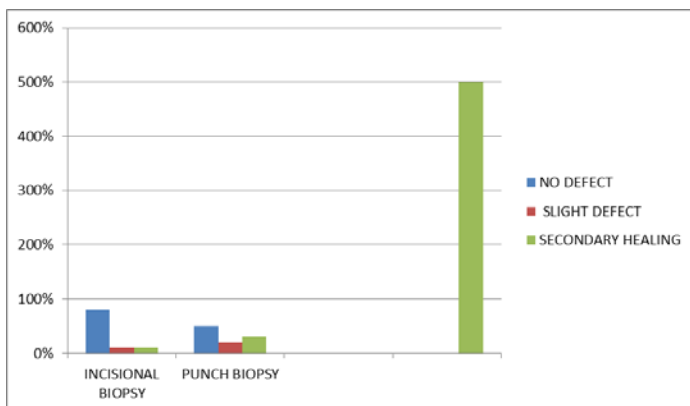
	No Swelling	Mild To Moderate
Incisional biopsy	40%	60%
Punch biopsy	80%	20%



In case of incisional biopsy all specimen has undergone histopathological study (100%). In case of punch biopsy only 32 specimens (80%) had undergone histopathological study, 8 specimens was taken under procedure but did not show any definitive histopathological result. Histopathological report shown 70% same diagnosis in both incisional and punch biopsy. In 6 cases (15%), it showed different histopathological report in incisional biopsy group and in 6 cases (15%) there was no relevant result found while in case of punch biopsies 4 reports (12.5%) showed different diagnosis while 8 reports (25%) showed irrelevant result.

	Specimen	Sample Used	Same Diag	Diff Diag	Irrelevant Result
Incisional Biopsy	40	40	28	6	6
Punch Biopsy	40	32	20	4	8

	With Defect	Slight Defect	Sec. Healing
Incisional biopsy	80%	10%	10%
Punch biopsy	50%	20%	30%



Discussion

Traditionally incisional biopsy has been advocated for diagnosis of oral pathology however, punch biopsy has recently been recommended as a quicker, easier technique with fewer complications.¹ In our case control study 40 incisional and 40 punch biopsies took randomly from patients reported to our department of oral and maxillofacial surgery. Out of 40 punch biopsies, 8 specimens did not give proper histopathological result after processing due to insufficient tissue.

A study which was conducted on “efficacy of incisional versus punch biopsy in the histological diagnosis of periocular skin tumors” concluded that both incisional and punch biopsy techniques have relatively high accuracy rates and high concordance between tissue diagnosis made by each of these techniques. Incisional techniques should preferably be performed on any atypical lesion. Punch biopsy is a quick and simple procedure as it is easy to perform in an outpatient department and requires

minimum of surgical equipment with no specific surgical skills.¹

In our study only 32 punch biopsies specimen used, 8 specimens did not give any definitive result might be due to insufficient tissue, tissue crushing during procedure and procedural artifacts. Incisional or punch biopsies can be perilous for histopathologic determination of invasion, and both over and underestimation of invasion can occur when using incisional biopsy. According to Giovanni D Lorusso et al, several scenarios that can lead to over and underestimation of depth of invasion in incisional biopsy specimens.¹⁰

It was assumed that when the wedged shaped specimen has similar dimensions of each major surface but problem arise in orienting the specimen.¹¹ In our case, as the suture was attached to the epithelial surface of incisional biopsy specimens, the problem in orienting the specimen was not encountered. Further, reliance was not placed on marking the mucosa with any colored solutions as such an application can interfere with tissue processing and staining procedure.

According to Arfaan Saeed, there were no such differences in adequacy and integrity between the samples obtained using a 5 mm punch forceps, for microscopic interpretation.¹¹ In our study 40% cases of incisional biopsy shows no swelling, and 60% cases shows mild to moderate swelling after 5th post operative day. In punch biopsy cases 80% cases donot have any swelling and only 20% cases have mild to moderate swelling, which was less as compared to incisional biopsy.

A visual analogue scale (VAS) was used to assess postoperative pain and swelling in 40 patients with lesions that were amenable to histopathological study, in whom the oral mucosa was biopsied under local anaesthesia, after informed consent as obtained. In our study incisional biopsy shows 80% cases without defect, 10% cases with

slight defect and 10% with secondary healing after 5th day post operatively. A total of 40 samples of oral mucosa were obtained from 40 adult by the experienced oral surgeons, evaluating the presence of artifacts attributable to the surgical site technique (crush, splits, fragmentation, pseudocysts and hemorrhage) and those attributable to sample processing in the laboratory (orientation).⁹

However, we found that incisional biopsy specimens showed fewer number of crush artefacts in the base as well as in the specimen proper as compared to the punch biopsy specimens. This could be attributed to the fact that we used blunt forceps instead of toothed forceps during punch biopsy and the tissue was handled only at the base of the specimen, where usually fat or muscle is present. Previous studies also indicate that the suture traction with the subsequent use of scalpel produced crushing of the biopsy specimen.

Tissue specimens from the oral cavity are often small in size, thereby necessitating stringent precision in technique at every step to prevent artefacts from occurring which eventually helps in accurate diagnosis.

Conclusion

Both incisional and punch biopsy technique have relatively high accuracy rates and there is a high concordance between tissue diagnosis made by each of these techniques. Incisional techniques should preferably be performed on any atypical lesion. Punch biopsy is a quick and simple procedure and it is easy to perform in an outpatient department and requires a minimum of surgical equipment and no specific surgical skills. As compared to punch biopsy, in incisional biopsy all specimen used for histopathological diagnosis. Post operative complications were less in case of punch biopsy and defect was less in case of incisional biopsy. This study shows that efficacy of incisional biopsy is more as compared to punch biopsy.

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Legend Figure

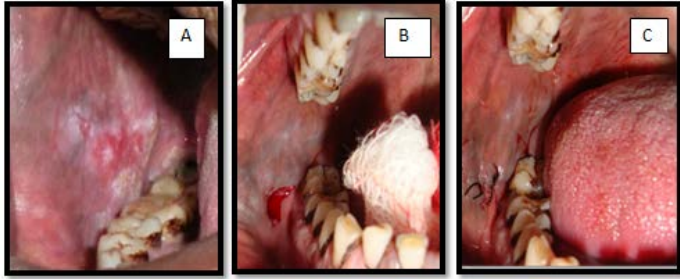


Fig 1: showed area from where the sample was taken using punch biopsy forceps

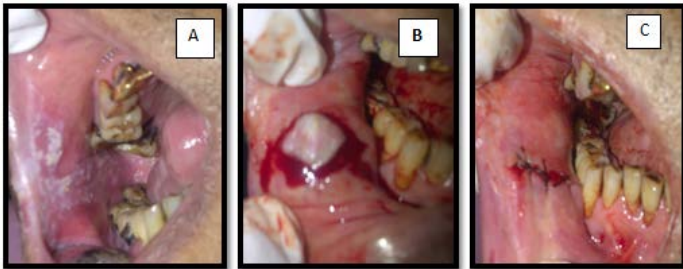


Fig 2: represents a case of incisional biopsy: 2(A) shows preoperative lesion present, 2(B) shows the area from where the specimen was taken using scalpel and blade, and 2(C) shows post biopsy suturing