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ORIGINAL ARTICLE

Histopathology of Noncutaneous Small Biopsy Specimens: The Diagnostic Value of Deeper Sections

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ABSTRACT

Objective: This study aims to determine the incidence of deeper sections and the diagnostic value of these sections in non-cutaneous small biopsy specimens taken at a hospital.
Study Design: Cross-sectional study
Place and Duration: DHQ Teaching Hospital, Abbottabad; Jan 2022-Jun 2022.
Methods: 76 patients aged 18-48 were presented in this study. Patients admitted to the oral and maxillofacial department who underwent deeper sections were included. After obtaining informed and written consent, complete demographic information was obtained. In all cases, the sites of organs and levels for seep sections were recorded. Categorical variables were assessed using mean, standard deviation, frequency, and percentages.
Results: Researchers found that majority of the deeper sections, 40 (52.6%) cases were from the cervix, followed by stomach, endometrium, and colorectal. Level 4 was the most commonly performed deeper section among 18 (23.7%) cases. Even though a diagnosis could be made from the first slide, deeper levels were examined in 41 (53.9%) cases to explore other histological characteristics. This was to either increase the reliability of the diagnosis made from the first slide or to confirm that diagnosis. Of these 41 instances, 14 (34.1%) revealed the same histological characteristics in deeper sections, whereas 27 (65.9%) revealed new pathological abnormalities.
Conclusion: A definitive diagnosis often has to be based on a deeper section. Therefore, regardless of the lesion size, it is advised that deeper areas be performed on samples that cannot be reliably identified on normal levels. This procedure should be standardized worldwide.
Keywords: Deeper Sections, Histopathology, Biopsy, Non-cutaneous

INTRODUCTION

Histopathology is the preferred way of diagnosis when it comes to conditions affecting the mouth and jaw. After a biopsy has been obtained, the tissue sample has to go through several processes, such as grossing, embedding, subdividing, and staining, before the cell architecture can be used to diagnose. When a pathologist demands many sections at varying depths before providing a conclusive diagnosis, this creates a situation in which deeper sectioning becomes necessary. [16,17]

Because of the lack of precision and overlap among microscopic features, doing routine histology might make it challenging to make a diagnosis of a medical condition.[21] After going through the initial slides, if the oral pathologist notices something that should raise some red flags, they may suggest that the use of retrospective step sections obtain deeper levels. The practice of perspective step sections, wherein the step sections are prepared before the slides are given to the oral pathologist, is advocated by a tiny percentage of laboratories. Samples of deeper layers of the skin are helpful in the diagnosis of skin cancer approximately one-third of the time. [1-3]

There have been a lot of investigations on the question of how many levels or sections should be included in tiny biopsies. There has been a lot of discussion on how the best sectioning should have between three and four layers [4-6]. However, it has been challenging to come to any general conclusions regarding this topic. When looking for a colorectal polyp, it is advised that you use as many as six different levels of examination [7,8]. Despite this, studies have discovered tubular adenomas even at levels 7 and 8 in colorectal biopsy specimens that were initially negative [9]. Even though a prior study found that only 10 percent of colorectal polyp biopsies yielded diagnostic results once deeper sections were performed up to 380 m [10], we routinely execute such segments in our laboratory because they are widespread in many institutions.

This is even though the previous researchers revealed that only 10% of colorectal polyp biopsies resulted in diagnostic results. It has been demonstrated that additional information obtained from deeper sections can help identify tiny biopsy specimens, eventually leading to improved diagnostic accuracy and, consequently, better care for patients [11-15].

MATERIAL AND METHODS

This cross-sectional study was conducted at DHQ Teaching Hospital, Abbottabad, and comprised 76 patients. After obtaining informed and written consent, complete demographic information was obtained.

Before grossing, preparing the tissues, and embedding the specimens, small biopsies were performed, and the samples were then kept in 10% formalin. First, the blocks were embedded in paraffin, and then slices were cut from those blocks, deparaffinized, placed on microscope slides, and stained with eosin and hematoxylin (H&E). The slides were examined under a light microscope by a consultant histopathologist searching for microscopic evidence. The definitive diagnosis was arrived at following the examination of the deep sections, which had been advised, which confirmed the preliminary results of the microscopic study and the clinical history. To proceed with our inquiry, we carefully examined each slide to determine whether or not any of the concealed layers had more information. All of the operational definitions used here and elsewhere, in addition to the many factors that go deeper, were considered. We evaluated what we refer to as "deeper parts," which have a thickness of more than 5 meters and consist of the following components: To clarify, a numerous step/serial section (MSS) is one that occurs taken after three or more regular segments; a walk section, as well as a step cut (SC), is chosen to take it after every subsequent section; a two-step segment (SC) is taken after every two components; a 3-step area (SC) occurs taken after every three parts; and so on. (e) a deep cut (Dp) is a portion that is also cut deeper than 3 feet, depending on the quantity of reserve tissue that is present; (f) a thin slice (TS) is a segment that's also sliced lighter than 3 m; and (g) one level is defined as one part that is displayed on a slide. All the data were analyzed with SPSS version 24.0, and the presentation of the results included frequency and percentage breakdowns.

RESULTS

Researchers found that the majority of the deeper sections, 40 (52.6%) cases were from the cervix, followed by the stomach, endometrium, and colorectal (Table 1)

Table-1: The Demographics of the Patients who were presented

Variables	Frequency	Percentage
Different Organs		
cervix	40	52.6
stomach	16	21.1
endometrium	12	15.8
colorectal	8	10.5

Level-4 was the most common performed deeper section among 18 (23.7%) cases.(figure 1)

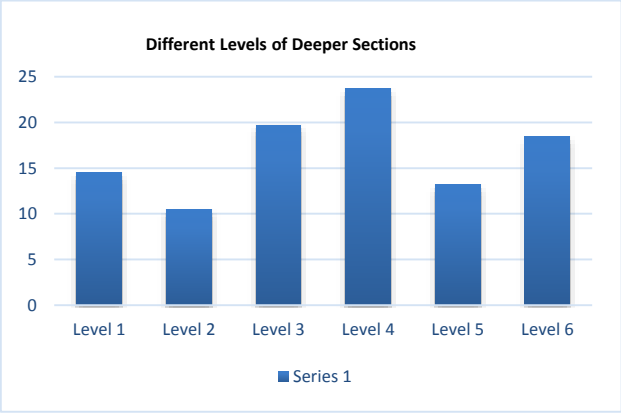

Figure-1: Various Depths of Deeper Parts in Each Scenario

Although a diagnosis may be reached after seeing only one slide, deeper levels were examined in 41 (53.9%) cases to explore other histological characteristics. (Table 2)

Table-2: Characteristics of Histologic

Variables	Frequency	Percentage
Histopathological Diagnosis		
First Slide	41	53.9
Different Slides	35	46.1

This was to either increase the reliability of the diagnosis made from the first slide or to confirm that diagnosis. Of these 41 instances, 14 (34.1%) revealed the same histological characteristics in deeper sections, whereas 27 (65.9%) revealed new pathological abnormalities. (Figure 2)

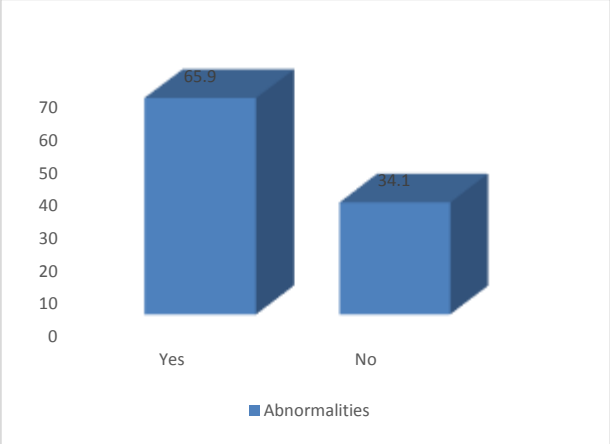

Figure-2: Frequency of Abnormalities among First Slide Histopathological Biopsies

DISCUSSION

Average biopsy results may be available as soon as two to three days after the lab receives the sample. Surgeons anticipate the histology report with bated breath since a delayed diagnosis directly impacts the treatment strategy and patient care. [16,17] The most frequent result of sampling mistakes due to inadequate sectioning through the tissue block is a false negative diagnosis in pathology. [18] There has been no agreed-upon method for sectioning oral biopsy specimens. More profound sectioning techniques for maximizing diagnostic information have been debated. To account for the fact that histopathologic evaluation is prone to sampling error, many hospitals and labs 'preorder' deeper sections for some instances (termed prospective deeper sections), while others request additional deeper sections if the forensic expert is unable to make a diagnosis from the initial section (referred to as retrospective deeper sections). [19] While this method does improve the diagnostic accuracy of oral biopsies, the additional time and money required to prepare and examine the more tissue sections is a drawback (particularly in the case of retrospective deeper sections). As a result, every oral pathologist wonders: what should the standard approach be for projected deeper sections to save time and money with a more accurate diagnosis?

The chance of deeper sections is lowered if the lab technician is well-supervised and trained in tissue orientation. There are a few alternatives for depicting the appearance of biopsy tissue in three dimensions, including inking the specimen [20] and measuring and drawing the sample. In either case, the technician may avoid damaging the specimen's surface and acquire a clearer view of the specimen's form when he trims the block to size. Data shows that getting more profound tissue levels is preferable when the biopsy sections are oriented incorrectly or when histological findings in early areas are equivocal. [21]

Our research found that 23.7% of patients had more profound components at varying levels, which is in line with the findings of Patel et al. and Manyam et al. [22, 23]. This examination revealed a greater incidence of deeper sections than the results of the other two analyses, both of which relied entirely on comparable cases obtained from oral histology archives. This is most likely due to the inclusion of samples from two different organ systems that were biopsied for an extended period. Please don't take the following example of the number of biopsies submitted to our pathology lab too literally since it is simply a rough illustration of the data.

The value of deeper slices in dermatopathology has been the subject of several investigations. A study on deep sections for skin histology showed that they are more helpful in determining whether or not cutaneous cancer is present rather than redefining the diagnosis. A new diagnosis was established in 33% of instances. More crucially, 50% of cases were confirmed to be malignant once additional levels of skin samples were examined after an original diagnosis of keratosis [24,25]. Another study looked at how collecting deeper segments for dermatopathology affected clinical outcomes. They discovered that in 9% of instances, the diagnosis was revised, leading to a shift in therapeutic therapy for 56% of patients. [19] Prospective step sections were shown to be helpful by Bruecks et al. [18] in enhancing diagnostic precision and turnaround time for tiny skin biopsies with a negligible increase in cost.

In the current study, a diagnosis may be reached after seeing only one slide; in 41 (53.9%) cases, deeper levels were examined to explore other histological characteristics. This was to either increase the reliability of the diagnosis made from the first slide or to confirm that diagnosis. Of these 41 instances, 14 (34.1%) revealed the same histological characteristics in deeper sections, whereas 27 (65.9%) revealed new pathological abnormalities. An example of granulomatous dermatitis of the gingiva was calcified like cement in a deeper area. Another patient's primary tumor was diagnosed as early-stage, aggressive squamous cell carcinoma. Given the possibility of further deep

invasion zones, the section was suggested to be more profound. Yet the invading regions continued to appear the same as they did on the first slide. Diagnosis errors and the litigation that follows them have been said to be preventable by extensive multi-level exams. [26] This study highlights the diagnostic value of deeper sections in gastrointestinal pathology by showing that further step sections of colon biopsies previously characterized as regular led to new diagnostic information, such as tube adenoma and lymphocytic colitis. [27]

There was tissue section attrition in deeper sections in 2.6% of instances, which was consistent with the studies of Parameswaran et al. [28] (1.3% of cases) and Yadav et al. [29] (3.6% of cases). This demonstrates that there are situations in which more extended parts are not preferable. Thus, it is essential to exercise caution while obtaining the deeper sections. Near-level cutting would likely resolve the problem of tissue segment losses in deep areas rather than jumping between both microns.

CONCLUSION

A definitive diagnosis often has to be based on a deeper section. Therefore, regardless of the lesion size, it is advised that deeper areas be performed on samples that cannot be reliably identified on normal levels. This procedure should be standardized worldwide.

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