

The Frequency and Diagnostic Value of Deeper Sections in Histopathology of Non-Cutaneous Small Biopsy Specimens Obtained from a Tertiary Care Hospital

MOHIBULLAH KHAN¹, FATIMA DAUD², NAJMA ATTAULLAH³, SHAILA MEHWISH⁴, NABIHA NAEEM⁵, INAM-U-LLAH⁶, TANVEER TARA⁷, SUDHAIR ABBAS BANGASH⁸, IRFAN ULLAH⁵

¹Department of Pathology, Pak International Medical College, Peshawar

²Department of Anatomy, Pak International Medical College, Peshawar

³Department of Anatomy, Khyber Girls Medical College, Peshawar

⁴Assistant Professor, Department of Health Biotechnology, Women University Swabi

⁵Department of Life Sciences, School of Science, University of Management and Technology Lahore, Pakistan

⁶Department of Food Science, the University of Haripur, KPK, Pakistan

⁷Department of medical lab technology National Skill University Islamabad, Pakistan

⁸Faculty of Life Science, Department of Pharmacy, Sarhad University of Science and Information Technology, Peshawar

Corresponding author: Najma Attaullah, Email: drnajmaahmad@gmail.com

ABSTRACT

Objective: The purpose of this research is to ascertain the frequency of deeper sections and the diagnostic utility of these sections in non-cutaneous tiny biopsies obtained from a hospital setting.

Study Design: Cross-sectional study

Place and Duration: This study was carried out at Shaukat Khanum Memorial Hospital Peshawar, Jan 2022 to April 2022

Methods: In this study, there were a total of 100 patients, ranging in age from 16 to 50 years old. Patients who were hospitalized to the oral and maxillofacial department and who had deeper section procedures were considered for inclusion. Following the acquisition of informed and written consent, complete demographic information was obtained. The locations of organs and the levels at which leaks were found were documented for each and every instance. The mean, standard deviation, frequency, and percentages were the metrics that were used to evaluate the categorical variables. All of the data was analysed with SPSS version 22.0.

Results: Among the deeper sections, we discovered that cervix cases accounted for 50%, stomach cases accounted for 25%, endometrial cases accounted for 15%, and colorectal cases accounted for 10%. Twenty-six instances 26%, had a deeper section done, with level 4 being the most prevalent. Although in most cases a diagnosis could be determined from the initial slide, in 55 of these cases (55%), further slides were reviewed to look for additional histological features. The goal was to either confirm the diagnosis obtained from the initial slide or raise confidence in that diagnosis. In 55 cases, 39 (70.9%) showed new pathological abnormalities in deeper sections, whereas 16 (29.1%) showed no change in histological features.

Conclusion: A more in-depth examination is typically required in order to arrive at a certain diagnosis. Because of this, it is recommended that, regardless of the extent of the lesion, deeper sections be conducted on samples that cannot be consistently detected on ordinary levels, and this approach need to be standardized everywhere in the globe.

Keywords: Histopathology, Deeper Sections, Non-cutaneous, Biopsy

INTRODUCTION

Tissue is biopsied when it is surgically removed from a living creature for microscopic inspection and diagnosis. Clinical care of the patient for improved prognosis benefits from a histopathological diagnosis. Some lesions may be diagnosed clinically by a dentist, but this should be seen as a preliminary diagnosis at best. As such, the pathologist's report is crucial to making a conclusive diagnosis. [1] There are times when a pathologist needs to see deeper sections for a certain diagnosis, and this calls for more precise sectioning.

Depending on the needs, the tissue block can be cut into a variety of parts. In serial sectioning, a paraffin block is used to cut a continuous ribbon of sections, which are then individually cut and placed on separate slides. [2] Serial slices are collected so that changes in tissue may be studied at varying depths. Step sectioning involves removing and discarding pieces at regular intervals before mounting the final section on a glass slide. [3] When compared to serial sections, step sections are favoured because the intermediate unstained sections can be used for specific stains if necessary [4] or saved for later. After the initial slides have been evaluated by the pathologist, deeper levels are typically acquired at the request of the pathologist, a process known as retrospective step sections. A projected step section is a type of step section generated in certain laboratories before the histopathologist has ever seen the slides. [5] The terms deeper sections, serial sections, and step sections are sometimes used interchangeably since all three are necessary to locate positive regions that might lead to a correct diagnosis.

Tissues that range from a few millimetres to a few centimetres in size are considered small biopsy samples [6]. These

tissues are often easy to handle without the need for dissection, since they may be immediately processed, implanted, and sectioned. Most biopsied tissues may be examined in detail at many magnification levels, enabling the pathologist to form a holistic opinion on the specimen [6]. In order to increase the sensitivity of disease detection, deeper tissue sections are routinely required. There are several other types of sections available to choose from [7], including step section, multi stage section, deep cut, and better section.

Several studies have been conducted to ascertain the optimal sections and/or levels in tiny biopsies. Several researchers [8,9] have shown that dividing into three or four levels is optimal, but they have found it challenging to generalize these findings. If you have a colorectal polyp, you should go to at least the third or sixth level [10]. Tubular adenomas, however, have been found at levels 7 and 8 in several trials, despite the fact that the original colorectal biopsy material was negative [11]. Another research found that when deeper sections were conducted (up to 380 m), diagnostic results were found in 10% of instances with nondiagnostic colorectal polyp biopsies [12].

Our laboratory is similar to those found in many medical facilities in that it routinely employs deeper sections. The diagnostic accuracy is improved, leading to better overall patient care [10, 12], and deeper sections are useful in giving more data during the definitive diagnosis of tiny biopsy specimens.

MATERIAL AND METHODS

This cross-sectional study was conducted at Shaukat Khanum Memorial Hospital Peshawar, Jan 2022 to April 2022 and comprised of 100 patients. Small biopsies from the gastrointestinal

tract (GIT) and the female reproductive system were included in the study, both of which were submitted to the Department of Pathology. Due to sample size constraints, this study only included tissue samples from the digestive system.

Small biopsy specimens were taken and stored in 10% formalin before undergoing grossing, tissues processing, and embedding. Blocks were fixed in paraffin, and then sections were cut, deparaffinized, mounted on microscope slide, and stained with eosin and hematoxylin (H&E). Consultant histopathologist looked for microscopic evidence by viewing the slides using a light microscope. The final diagnosis was made after studying the deep sections as recommended, which confirmed the early microscopic results and clinical history. To further our investigation, we dissected each slide to see whether any hidden layers contained further data. The many operational definitions used here and elsewhere, as well as the many deeper aspects, were all considered. For the investigation of deeper tissues, we analyzed what we call "deeper sections," which have a thickness of more than 5 m and comprise the following: To clarify, a multiple step/serial section (MSS) is one that is taken after three or more regular sections; a walk section as well as step cut (SC) is one that is taken after each subsequent section; a two step section (SC) is one that is taken after every 2 segments; a 3-step section (SC) is one that is taken after every three sections; and so on. (e) a deep cut (Dp) is a section that's also cut deep than 3 m, depending on the quantity of reserve tissue present; (f) a thin slice (TS) is a segment that is sliced thinner than 3 m; (g) 1 level is defined as one section on a slide. All of the data was analyzed with SPSS version 22.0. We used frequencies and percentages for data presentation.

RESULTS

Among the deeper sections, we discovered that cervix cases accounted for 50%, stomach cases accounted for 25%, endometrial cases accounted for 15%, and colorectal cases accounted for 10%.(figure 1)

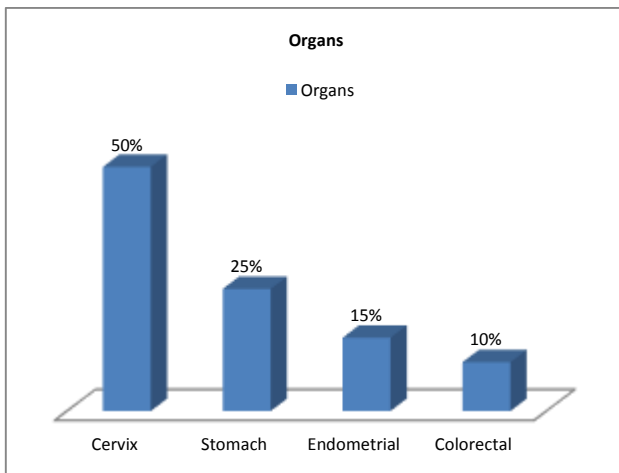


Figure-1: Different organs diagnosed by deeper sections

Twenty-six instances 26%, had a deeper section done, with level 4 being the most prevalent.(table 1)

Table-1: Different levels of deeper sections among all cases

Variables	Frequency	Percentage
Levels of Deeper Sections		
1	18	18
2	13	13
3	20	20
4	26	26
5	13	13
6	10	10

Although in most cases a diagnosis could be determined from the initial slide, in 55 of these cases (55%), further slides were reviewed to look for additional histological features. The goal was to either confirm the diagnosis obtained from the initial slide or raise confidence in that diagnosis. In 55 cases, 39 (70.9%) showed new pathological abnormalities in deeper sections, whereas 16 (29.1%) showed no change in histological features.(table 2)

Table-2: Features of histopathological findings

Histopathological	Frequency	Percentage
Diagnosis		
Initial Slide	55	55
Other Slide	45	45
Abnormalities in Deeper Sections		
Yes	39	70.9
No	16	29.1
No	55	100

DISCUSSION

After the reporting pathologist examined the preliminary slides, further slices were obtained at a predetermined distance, each with a thickness of 3-5 m. Better section, deep cut, step section, or several serial sections were all terms for these deeper parts; the levels were then assigned to each of them. The levels of difficulty ranged from one for a single-step portion to three for a multi-step one. It was determined whether or not there were any new features in later portions by carefully examining each level. A total of 28.2% of the patients had significant findings that aided in the diagnosis in some way, and 2.2% had extra diagnostic findings. Our findings (40 instances had extra discoveries in deeper sections) and those of previous research support the use of deeper sections in tiny biopsies as a means of increasing diagnostic sensitivity and accuracy.[13,14]

Our findings showed that 26% of patients had deeper parts at varied levels, which is consistent with those of Patel et al. [15] and Manyam et al. [13]. Our study indicated a slightly higher frequency of deeper sections compared to other two investigations, which solely used similar cases from such an oral histology archive. This is likely owing to a inclusion of lasts for a short biopsy samples from both independent organ systems. This is just a rough illustration of the number of biopsies sent to our pathology lab, so don't take it too literally.

The likelihood of deeper sections is reduced if the laboratory operator is properly supervised and trained with regard to tissue orientation. Both inking the biopsy specimen [15] and measuring and sketching the look of biopsy tissue in three dimensions are viable options. Both methods will help the technician avoid cutting through the specimen's surface, allowing him to get a more accurate picture of the specimen's shape when he cuts the block to size. When the biopsy sections are orientated wrongly or the histological findings in first sections are ambiguous, studies show it is desirable to get deeper levels. [16]

In our study, initial slide in 55 of all cases, further slides were reviewed to look for additional histological features. The goal was to either confirm the diagnosis obtained from the initial slide or raise confidence in that diagnosis. In 55 cases, 39 (70.9%) showed new pathological abnormalities in deeper sections, whereas 16 (29.1%) showed no change in histological features. Cementum-like calcification was seen in a deeper part of a case of granulomatous dermatitis of the gingiva. Early aggressive squamous cell carcinoma was seen in the primary tumour portion of another patient. Deeper portion was recommended since it was possible that there were further regions of deep invasion. However, the invading territories looked the same as they had in the first slide. Some have suggested that by conducting thorough multi-level examinations, diagnostic mistakes and the ensuing litigation can be avoided. [17] Additional step sections of colon biopsies initially described as normal revealed new diagnostic information, including tube adenoma and lymphocystic colitis, which

demonstrates the diagnostic usefulness of deeper sections in gastrointestinal pathology. [18]

When deeper sections were collected at 40% to 60percentage points into the block, which corresponds to about >100 levels in our analysis, Luo et al. [19] observed difference in findings to initial sections in 17% of the instances. However, none of the samples came close to reaching that point. This was due in part to the fact that, since ours was indeed a cross-sectional research, we did not break from our standard procedures, and we were not yet prepared to test out deeper depths. [20]

CONCLUSION

A more in-depth examination is typically required in order to arrive at a certain diagnosis. Because of this, it is recommended that, regardless of the extent of the lesion, deeper sections be conducted on samples that cannot be consistently detected on ordinary levels, and this approach need to be standardized everywhere in the globe.

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