



STUDY OF DIAGNOSTIC EFFICACY OF CYTOSMEARS VERSUS CELL BLOCK TECHNIQUE IN THE EVALUATION OF FLUID CYTOLOGY

Pathology

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ABSTRACT

Introduction: Cytological examination of serous fluids is of paramount importance not only in detecting cancer cells, but it also reveals information regarding various inflammatory conditions of serous membranes, various bacterial, viral, fungal infections and parasitic infestations.

Materials & Methods: The present study is a prospective study done for a period of two years. All the details of the case were taken, initially fluid cytology examination was done for total count and differential count using Leishmans stain and Neubauer chamber. Later on cell block is made for the same case and studied and compared.

Results: A total of 120 fluids were examined and among them pleural fluids constituted highest number of cases followed by peritoneal fluid and pericardial fluid. Synovial fluid was not considered in our study. Age group between 41-50 years contributed highest number of cases and male patients contributed more cases than females.

Conclusion: Cell block technique or paraffin embedding of sediments of fluids is amongst the oldest methods of preparing materials for microscopic examination. The main advantage of the cell block over smear examination is the better preservation of architectural details and ease of obtaining multiple sections for special stains and immunohistochemistry.

KEYWORDS

Cell block, fluids, cytology, cytosmears

INTRODUCTION

Every pleural, peritoneal and pericardial effusion contains cells, often numerous, occasionally scanty. The non-neoplastic cells commonly found in serous effusions are those derived from blood (erythrocytes, leucocytes and histiocytes) and from the serosal lining the mesothelial cells. The proportion of the different types of these cells varies depending on cause and duration of effusion and the presence or absence of inflammation.

The appearance to the naked eye of a serous effusion sometimes reveals clues about the cause of the effusion and the nature of its cellular contents. Therefore, for every serous effusion received by the laboratory, note should be made of its volume, color, clarity, and any unusual physical features, such as malodour, opalescence, or high viscosity.

Commonly heavily bloodstained effusions are likely to be caused by cancer and that such effusions are more likely to contain cancer cells. A serous effusion occasionally contains so many cancer cells that if allowed to stand and sediment spontaneously, the cells form a thick, whitish-yellow layer at the bottom of the container. Spontaneously occurring sediment of similar appearance may develop in fluids containing numerous neutrophilic leukocytes. Such purulent fluids may be malodorous owing to a high bacterial content.

MATERIALS & METHODS

The present study is a prospective study done for a period of two years from October 2016 to September 2018. A total of 120 cases were studied in the present study. Various fluids like Pleural fluid, peritoneal and pericardial fluid were considered. Synovial fluid was not considered in our study. Complete history was taken and all the samples were thoroughly examined including physical and chemical examination.

For every sample we received in the laboratory half of the specimen was centrifuged at 1500 rpm for 15 min, supernatant is discarded, from that sediment smears were prepared and stained with Hematoxylin and eosin and Romanowsky preferably with Leishmann's stain. Total count was done using Neubauer chamber and differential count was done using slides stained with leishman stain.

There are various methods of cell block preparations. We routinely follow the method in which the fluid was collected and centrifuged at 2500 rpm for 15 minutes. Fresh 3 ml of 10% formalin was added to the sediment after discarding the supernatant and kept for 24 hours. After 24 hours the sediment which contained the cell button was processed along with other routine biopsy specimens. Sections were taken and stained with H&E and submitted.

RESULTS

A total of 120 cases were considered and among them pleural fluid constituted highest number of cases (92), [Table 1] followed by peritoneal and pericardial fluid. Only 10 pericardial fluids were studied. Majority of the cases were diagnosed as inflammatory smears followed by malignant cases in all the three fluids. Age group between 41-50 contributed highest number of cases with male predominance in our study.

Table 1: Showing different fluids in our study

| Sl No | Type of fluid | Number of cases |
|-------|-------------------|-----------------|
| 1 | Pleural fluid | 92 |
| 2 | Peritoneal fluid | 48 |
| 3 | Pericardial fluid | 10 |
| Total | | 120 |

Table 2: Showing results in different fluids

| Sl no | Pleural fluid | Peritoneal fluid | Pericardial fluid |
|---------------------------|---------------|------------------|-------------------|
| Inflammatory | 72 | 40 | 08 |
| Suspicious for malignancy | 06 | 04 | 00 |
| Malignancy | 06 | 02 | 00 |
| No cellularity | 08 | 02 | 02 |
| Total cases | 92 | 48 | 10 |

Cell block was made only in 109 cases and in other cases the sample was not adequate and no conclusive opinion was possible for those cases. We compared our findings with clinical pathology findings and in all cases including both inflammatory, suspicious for malignancy and in malignant conditions. Suspicious cases were diagnosed as malignancy on cell blocks and all cases were correlated both cytologically and on cell block.

DISCUSSION

Accumulation of fluid in a body cavity is referred to as serous effusion and is classified into two types-transudate and exudate. All effusions are pathological regardless of their cellular constituents.¹ Cytological examination of serous fluids is one of the commonly performed investigations as it reveals information about inflammatory and malignant lesions of serous membranes.² Accurate identification of malignant or reactive mesothelial cells is a diagnostic problem in conventional cytological smears. Cytodiagnosis by conventional smears (CSs) have got lower sensitivity due to overcrowding of cells, cell loss and different laboratory processing methods.³

The cellblock technique of examining the fluids, along with concomitant use of smears has shown an added advantage in such cases. The main advantages of cellblock technique are preservation of

tissue architecture and to obtain multiple sections from the same material for special stains.³ The most common site of effusion was pleural, followed by peritoneal and pericardial effusion.

Our results correlated with the studies done by Foot et al⁴, van de Molengraft et al⁵, and Khan K et al⁶, wherein the number of pleural effusion cases outnumbered the ascites cases. Majority of the patients in these studies were males and the primary site being the lungs and gastrointestinal tract.

In the study done by Stonifer et al⁷, the most common site of effusion was peritoneal, followed by pleural and pericardial effusions. These results differed with our study which may be explained by the preponderance of females presenting with ascites in their studies.

CONCLUSION

Cell-block technique is one of the oldest techniques that is used in evaluating serous fluids. Today, in cell-block preparation, 10% formalin is used in fixation. The superiority of this technique is that it is easy, inexpensive and does not require a special team or instruments.

With this method, cellularity is increased, the morphological details are better observed, special histochemical stainings and immunohistochemical studies can be done. Thus, sensitivity in diagnosis increases. Compared with other conventional techniques, this technique is a more sensitive model.

We conclude that the cell block technique when used as an adjuvant to routine smear examination increases the diagnostic yield because of availability of more material for evaluation and better preservation of the cytoarchitectural pattern.

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