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### RESEARCH ARTICLE

#### CYTOLOGICAL DIAGNOSIS OF SEROUS EFFUSIONS BY USING CELL BLOCK TECHNIQUE

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#### Abstract

Cytological examination of body fluids has increasingly gained acceptance in clinical medicine to such extent that once positive diagnosis is made often considered definitive diagnosis & paramount important to identify type of malignancy.

**Aims and Objectives:** To study efficacy of cell block versus conventional smear examination of body fluids for cause & to assess utility of cell block method in cytodiagnosis.

**Materials & Methods:** Present study was conducted at D.Y. Patil medical college hospital, Kolhapur. Body fluids from 50 patients were subjected to routine smear examination as well as cell block preparation (Plasma-Thrombin method) and analysed for cellularity, arrangement, cytoplasmic, & nuclear details.

**Results:** Cellularity & additional yield for malignancy was increased by 12% by cell block method. Male:Female was 2:1, most of patients were age group of 41-50 years.

**Conclusions:** The cell block technique not only increased positive results, but also demonstrate better architectural patterns, which could be of great help in making correct diagnosis. Cell block tech was also useful for special stains & immunohistochemistry and give morphological details by preserving architectural patterns.

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#### Introduction:-

Cytological examination of serous body fluids to determine the presence of malignant cells has been done since many years in the diagnosis and eventual staging of cancers with increasing accuracy.<sup>6</sup> Generally, examination of the Cellblock or conventional smear technique involving centrifugation of the specimen has been used to make this evaluation.<sup>12</sup>

The accurate identification of cells as either malignant or benign reactive mesothelial cells is a diagnostic problem in conventional smears prepared from body cavity fluids. The lower sensitivity is due to bland morphological features of cells, overlapping of cells, loss of cells, and due to different laboratory processing methods.<sup>1</sup>

Since the introduction of the cell block technique by Bahrenberg in 1895, it has been used routinely for processing fluids.<sup>3</sup> Cellblocks helps to assess tissue architecture and obtain sections for further study in fluids that can not be definitely diagnosed by cytology alone.<sup>18</sup> Cellblock technique, has many advantages over conventional smear

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cytology in improving the sensitivity of diagnosis. The main advantages of Cellblock technique are preservation of tissue architecture and to obtain multiple sections from the same material for special stains and immunohistochemistry.<sup>18</sup>

### Methodology:-

Present study is study of 50 fluid samples received in Cytology section, of Department of Pathology, DY Patil Medical College, kolhapur, from May 2015 to April 2017 were included in this observational study.

After preparing conventional smear for H & E staining, the residual sample was subjected to cell blocks. To the sediment of one half of sample, 2 drops of plasma and 2 drops of thrombin was added, mixed well and allowed to clot for 30 sec. The sediment then transferred to lens paper inside the tissue cassette and dropped into 10% eosin tinted alcohol:formalin in 1:1 proportion and processed for paraffin embedding.

### Results:-

50 samples were subjected for cytological evaluation. Peritoneal fluids were 54%, pleural fluids were 46%. Maximum samples were in age group of 41-50 years. By CS benign, suspicious and malignant lesions were 84%, 8% and 8% respectively. By CB benign and malignant lesions were 80% and 20% respectively. Thus, diagnosing 12% additional malignancies by Cellblock method.

**Table 1:-** Number and Type of serous effusions

Type of Fluid	Number	Percentage (%)
Pleural	23	46
Peritoneal	27	54
Pericardial	00	00
Total	50	100

**Table 2:-** Showing Sex Wise distribution of fluid samples:

Sex	Number	Percentage (%)
Male	35	70
Female	15	30
Total	50	100

**Table 3:-** Showing No of patients in each Age Group :

Age group in yrs	No. of males	No. of females	Total No.	Percentage (%)
0 – 20	0	0	0	0
21– 40	10	10	20	40
41 – 60	22	3	25	50
61 – 80	02	1	3	6
81 – 100	01	1	2	4

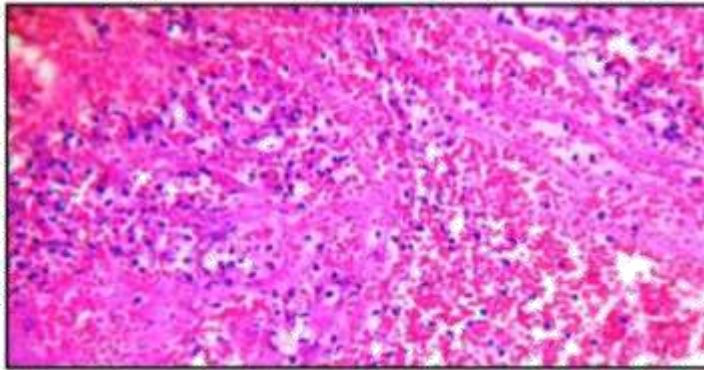
**Table 4:-** Cellularity in Conventional Smear (CS) and Cellblocks (CB)

Cellularity	CS		CB-PT	
	No	%	No	%
Mild	25	50	5	10
Moderate	20	40	10	20
Marked	5	10	35	70

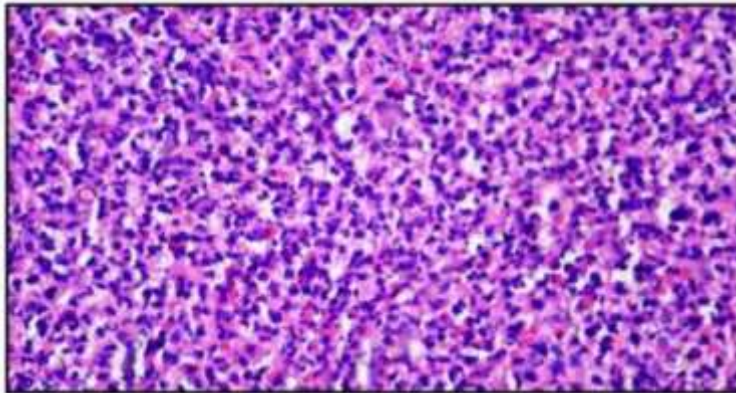
**Statistical analysis of serous effusions- 50 samples.**

S.no.	Features	CS		CB	
		No.	%	No	%
1	Benign	42	84	40	80
2	Suspicious	4	8	00	00
3	Malignant	4	8	10	20
	Total	50	100	50	100

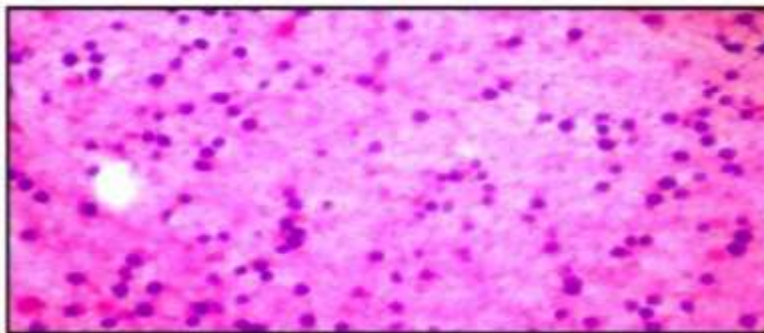
**Fig1:-** Shows mild cellularity in plasma- Thrombin Cellblock preparation. (H&E;X 400)



**Fig 2:-** Shows moderate cellularity in plasma Thrombin Cellblock preparation. H&E; X400)



**Fig 3:-** Shows marked cellularity in Plasma- Thrombin Cellblock Preparation. (H&E;X400)



**Discussion:-**

In this study an attempt was made to prepare and analyse both conventional smears and cellblocks from the same sample. Due consideration was given to age, sex, site of effusion and clinical findings to give final diagnosis.

We received 50 samples of body cavity fluids of which pleural fluid samples were more, comprising 46%, and peritoneal fluid samples were 54%. Similar findings were noted in a study, by Rajat Gupta et al<sup>16</sup>. The age of patients in our study ranged from 1 years to 88 years. Male to Female ratio was 2.3:1. In females, the most common age group was 31-40 years and in males it was 41-50 years. Maximum samples were in the age group of 41-60 years (50%). Least number of samples were in the age group of 01-20 years (0%).

In the present study, we evaluated Conventional Smears and Plasma-Thrombin cellblock preparation for the preservation of morphology of cells and cellularity. The recovery rate of tumour cells by cellblock preparation in a study by Surekha et al,<sup>37</sup> was 15% greater than that obtained for specimens examined in conventional smears. In a study by Dekker et al,<sup>52</sup> the rate of recovery of tumour cells by cellblock preparation was double that obtained by smears alone. Thapar et al,<sup>42</sup> showed a diagnostic yield of 20% by cellblock preparations. In the present study additional (12%) malignancy was diagnosed by cell block preparations.

We found that Plasma-thrombin method was most successful in generating cellular cell blocks. 35 out of 50 cases i.e. 70% were highly cellular or contained evaluable cellular material, 20% cases had adequate cellular material, only 10% cases had minimal cellularity.

In the present study diagnostic yield for malignancy was significantly increased by cellblock method. The present study identified additional 12% malignant lesions by cellblock method when compared to conventional smear study. In addition 4(8%) of the suspicious cases in conventional smear were diagnosed as malignant lesion by cellblock method. In study done by Agrawal et al<sup>12</sup> additional 10% of malignant lesions were identified method.

**Conclusion:-**

The cellularity was abundant and sufficient for diagnosis in cell block method, than the conventional smears that had minimal cellularity. Morphological features were better identified by cellblock method as compared to conventional smear method.

In cellblock method the cellular material is concentrated in a smaller area of the slide making the screening less time consuming and more efficient. Cell blocks are easy to prepare and process technically, are not much time consuming and are cost effective. Multiple sections of same sample can be obtained if required for further studies special stains or IHC study. Sensitivity for malignant lesion by cellblock methods was significantly increased as compared to conventional smear preparation alone.

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