
CASE REPORT**Transudative Effusion of Malignant Etiology: An Interesting Case Report**

Swathi Karanth M. P¹, Ketaki Utpat¹, Unnati Desai¹, Jyotsna M. Joshi^{1}*

¹Department of Pulmonary Medicine, Topiwala National Medical College, B. Y. L. Nair Hospital, Mumbai-400008 (Maharashtra) India

Abstract:

Pleural effusion is an entity perpetually encountered by physicians, having a panorama of etiologies. The occurrence of pleural effusion in a patient with malignancy adds multiple perspectives to the overall status of the patient in terms of symptomatology, staging, management and prognosis. Although effusion encountered in association with malignancies are conventionally exudative, transudative effusion can also manifest in certain singular circumstances. This conception is crucial to avoid misjudgments and delay in diagnosis. We hereby report an intriguing case of a transudative hemorrhagic pleural effusion in a patient with malignancy.

Keywords: Pleural Effusion, Transudative Effusion, Malignant Effusion

Introduction:

Pleural effusion is the commonest accompaniment of advanced neoplasms. Lung and breast cancer account for 50–65% of all malignant effusions, lymphomas, gastrointestinal and genitourinary tumours contribute for 25% and unknown primary are responsible in 7–15% [1]. Malignant Pleural Effusion (MPE) refers to pleural effusion with presence of malignant cells in the pleural fluid or pleura. Customarily, it has been thought that almost all MPE are exudative. On the contrary, studies have reported transudative MPE in the range of 1-10% [2]. Etiology of transudative MPE in these case scenarios includes malignancy itself, coexisting conditions and combination of both [3].

We report an unusual case of transudative MPE in a 65 year old man in whom further investigations revealed superior venacaval thrombosis.

Case Report:

A 65-year-old man presented to our outpatient department with two-month history of right sided chest pain, cough with scanty expectoration, dyspnea on exertion and recurrent episodes of vomiting. He had history of systemic hypertension and was on adequate treatment for the same. Our patient was a smoker with smoking index of 600 and denied current or previous alcohol use. Prior to his visit to our department, he was diagnosed as a case of right sided pleural effusion and had undergone right jugular venous catheterization, thoracocentesis and intercostal drainage tube insertion which was draining hemorrhagic pleural effusion. Pleural fluid analysis was suggestive of Transudative hemorrhagic effusion (Table 1). On examination, his vitals were normal. He had grade 2 clubbing and signs of volume gain and decreased breath sounds in the right hemithorax. His cardiovascular examination was unremarkable. His abdominal examination revealed epigastric tenderness but there was no guarding or diminished bowel sounds.

At the time of admission his total leucocyte count was elevated (40,100/cumm), hemoglobin, hematocrit and platelet counts were normal. Liver

and kidney function tests were unremarkable. Serum LDH was 607 U/L and serum amylase was within normal limits (78U/L). Two dimensional Echocardiography was suggestive of ejection fraction of 60 %, moderate pulmonary hypertension and hypertensive heart disease. Chest radiograph revealed right pleural effusion with mediastinal shift to the left. Computed Tomography (CT) thorax showed (Fig.1) right sided pleural effusion with visceral and parietal pleural enhancement and multiple pleural nodules. Abdominal CT was suggestive of cystic lesions in the distal body and tail of pancreas with dilatation of main pancreatic duct as well as its side branches (Fig. 1). Despite a transudative effusion, by corroborating his clinical and radiological features a provisional diagnosis of malignant pleural

effusion secondary to metastases from pancreatic tumour was made. His central venous catheter was removed and peripheral vascular catheter was secured. He was managed conservatively. Repeat pleural fluid biochemical investigations reconfirmed transudative hemorrhagic effusion. Second sample for cytology was positive for atypical degenerative cells. To confirm our diagnosis, patient was subjected for pleural biopsy and the histopathology of pleural biopsy supported our diagnosis of metastatic adenocarcinoma (Fig. 2). However atypical transudative effusion led us to investigate further. Elongated filling defects in right jugular vein and superior venacava at the level of pulmonary artery was evident on CT pulmonary angiography. Subsequently patient succumbed to the disease.

Table 1: Pleural Fluid Investigations

Parameters	1 st sample	2 nd sample	3 rd sample
Appearance	Reddish	Reddish	Reddish
Total white blood cell count (cumm)	6	500	946
Red blood cells (cumm)	+	+	+
Differential count	P ₃ L ₃	P ₁₀ L ₈₂	P ₆₅ L ₂₃ E ₈
Protein (g/dl)	1.9	2.98	1.73
Lactate dehydrogenase (U/L)	--	--	344
Pleural fluid protein/serum protein	0.2	0.4	0.39
Pleural fluid LDH/Serum LDH	--	--	0.56
Malignant cytology	Negative	Atypical degenerating cell	
Adenosine deaminase (U/L)	--	3.55	2
Gram staining	Negative	Negative	Negative
ZN stain	Negative	Negative	Negative

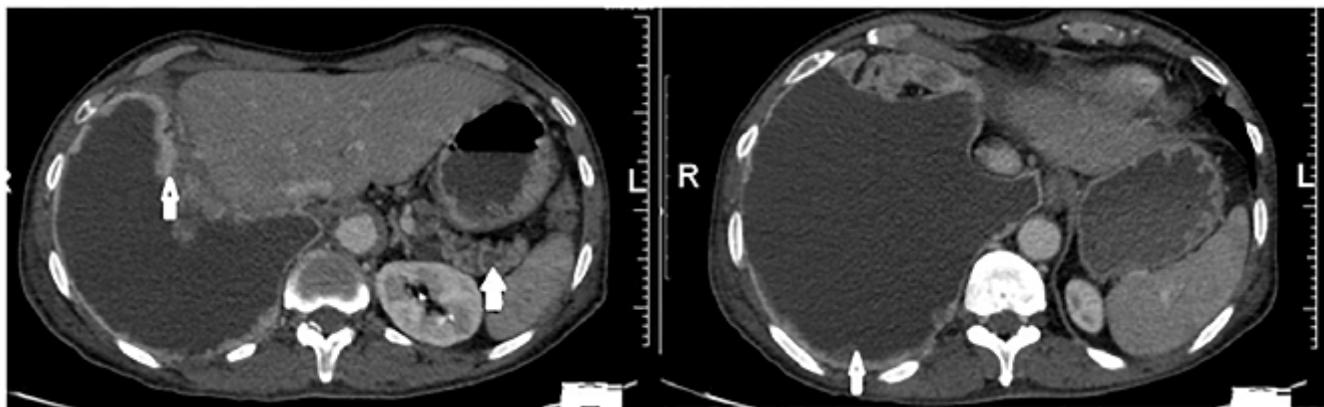


Fig. 1: CT Thorax and Abdomen showing Pleural Enhancement, Pleural Nodules (Arrow) and Effusion and Cystic Lesion in the Distal Body and Tail of Pancreas (Arrow).

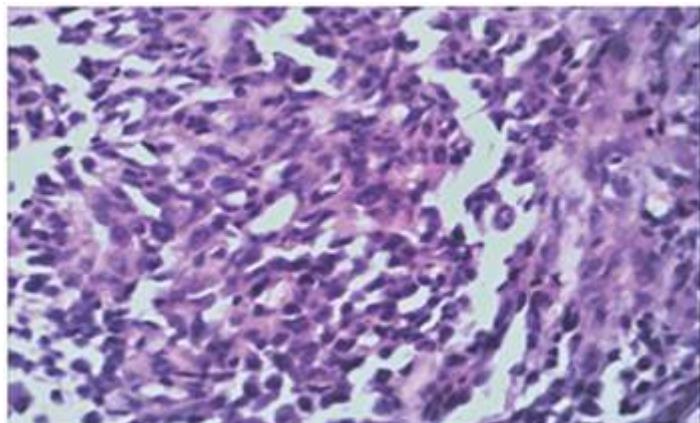


Fig. 2: Histopathology of Pleural Biopsy Suggestive of Moderately Differentiated Adenocarcinoma

Discussion:

Malignant pleural effusion is a common condition that is associated with advanced neoplasm and signifies poor prognosis. Nearly all neoplasms have been reported to metastasize the pleura [4]. Mechanism of pleural effusion in malignancy can be either direct or indirect. Direct causes include invasion of pleura by tumor or increased capillary permeability due to local inflammatory changes in response to tumor invasion. Effusions related to malignancy but negative on cytology are termed as “paramalignant effusions”. Important factors

causing paramalignant effusion include post obstructive pneumonia, post obstruction atelectasis, thoracic duct obstruction, pulmonary embolism and treatment related (drug induced) [4].

A preliminary step in evaluation of pleural effusion is to classify pleural fluid on the basis of Light's criteria into exudative and transudative. Traditionally it has been thought that transudative effusions are benign and further investigations are needless. Almost all MPE are exudative [5]. There

are exceptional transudative malignant effusion that may mislead the physicians. Unless suspected these may give false reassurance against malignancy. Several studies have reported transudative MPE in the range of 1-10% [2]. Few investigators use the term borderline transudative for those effusions that meet exudative criteria by LDH however fail to satisfy the protein criteria [6]. Reported causes for transudative malignant effusion include early stages of MPE where in low protein level in pleural fluid is attributed to Mediastinal lymph node involvement, endobronchial obstruction resulting in trapped lung, superior vena cava obstruction and coexisting hypoalbuminemia, cardiac, renal, hepatic failure [3, 6-7]. Our case was hemorrhagic transudative MPE with radiological features suggestive of pleural metastases and pancreatic malignancy. The cause for transudative MPE in our case was coexistent superior vena cava thrombosis. Pathomechanics of transudative effusion in superior vena cava obstruction is elevation of hydrostatic pressure in brachiocephalic vein and its draining tributaries which also include intercostal capillary veins that drain the parietal pleura [6]. We attributed right jugular venous and Superior venecaval thrombosis to central venous catheterization. Transudative pleural effusion has

been reported as a complication of central venous catheterization [8].

The debate in this evidenced based era is whether or not cytological investigations are mandatory for transudative effusion. Some investigators are pro for cytologic evaluation in transudative effusion, while others do not recommend the same [9-10]. Overlooking malignancy on the mere basis of biochemical fluid investigation will adversely affect diagnostics. It is important to corroborate clinical and radiological manifestations along with pleural fluid biochemical characteristics. Pleural fluid cytology is mandatory if clinical and radiological features are suggestive of malignancy and the yield of which is 62-90%. Pleural biopsy is indicated in cytology negative pleural effusion [11]. Investigation for the cause for transudative nature of the effusion is equally important to avoid inadvertent consequences of coexisting serious conditions like pulmonary embolism or SVC syndrome.

Conclusion:

All malignant effusion need not be exudative and a clinician should not scruple to investigate for malignancy in transudative effusion if clinically suspected. We also emphasize on scrutinizing the source of transudative fluid which may unmask dreaded conditions.

References

1. Roberts ME, Neville E, Berrisford RG, Antunes G, Ali NJ, BTS Pleural Disease Guideline Group. Management of a malignant pleural effusion: British Thoracic Society Pleural Disease Guideline. *Thorax* 2010;65(Suppl 2):ii32-40
2. Porcel JM, Alvarez M, Salud A, Vives M. Should a cytologic study be ordered in transudative pleural effusions? *Chest* 1999; 116(6):1836-7.
3. Ryu JS, Ryu ST, Kim YS, Cho JH, Lee HL. What is the Clinical Significance of Transudative Malignant Pleural Effusion? *The Korean Journal of Internal Medicine* 2003;18(4):230-233.
4. American Thoracic Society. Management of malignant pleural effusions. *Am J Respir Crit Care Med* 2000; 162(5):1987-2001.

-
5. Assi Z, Caruso JL, Herndon J, Patz EF Jr. Cytologically proved malignant pleural effusions: distribution of transudates and exudates. *Chest* 1998; 113(5):1302-4.
 6. Fernandez C, Martin C, Aranda I, Romero S. Malignant transient pleural transudate: a sign of early lymphatic tumoral obstruction. *Respiration* 2000;67: 333-6.
 7. Ashchi M, Golish J, Eng P, O'Donovan P. Transudative malignant pleural effusions: prevalence and mechanisms. *South Med J* 1998;91(1):23-6.
 8. Porcel JM. Unilateral pleural effusions secondary to brachiocephalic venous thrombosis: a rare complication of central vein catheterization. *Respiration* 2002;69:569.
 9. Moltyaner Y, Miletin MS, Grossman RF. Transudative pleural effusions: false reassurance against malignancy. *Chest* 2000; 118:885.
 10. Teklu B. Cytology on transudative pleural effusions. *Chest* 1999; 116:846-47.
 11. Johnson L, Fakih HAM, Daouk S, Saleem S, Ataya A. Transudative pleural effusion of malignant etiology: Rare but real. *Respiratory Medicine Case Reports* 2017;20:188-91.

*Author for Correspondence: Dr. Jyotsna M. Joshi, Department of Pulmonary Medicine, TNMC and BYL Nair Hospital, AL Nair Road, Mumbai Central, Mumbai- 400008 Maharashtra
Email: drjoshijm@gmail.com Cell: 09869627955