

Pleuro-Peritoneal Shunt in Intractable Pleural Effusion

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Pleuro-peritoneal shunt (PPS) is a known but sparingly used modality of treatment for refractory, recurrent pleural effusions^{1,2,3}. It is often resorted to as a last, desperate mean to control pleural effusion of known or unknown aetiology. A case of intractable pleural effusion that failed to resolve with conventional means including chemical pleurodesis and managed by establishing PPS is presented. The case is mainly presented for its importance as a sort of memory refresher to all concerned with management of these complicated clinical problems.

THE CASE

Seventy five years old male, Saudi, mechanically ventilated patient was referred to thoracic surgical service of Riyadh Central Hospital for right side pleural effusion secondary to bilateral aspiration pneumonitis a week ago. Past medical history included diabetes mellitus of seven years duration and right-sided hemiplegia and almost complete aphasia due to cerebrovascular accident four years ago. Right sided pleural effusion was drained with intercostal tube. Subsequently, patient developed left-sided pleural effusion necessitating intercostal drain a week later. Pleural fluid was clear, transudate with a few mesothelial and polymorphonuclear cells. Protein content varied from 5 to 9 gm/L, LDH 176 u/L, glucose content 12.48 mmol/L, Na⁺ 143 mmol/L and K⁺ 3.2 mmol/L. Culture of the pleural fluid was sterile. Total serum proteins were 51.6 gm/L with serum albumin 22.4 gm/L. Over a period of 34 days a total of 35.7 litre of pleural fluid was drained from the pleural cavities. Two courses of intrapleural tetracycline hydrochloride and intravenous albumin therapy failed to decrease the drainage. Therefore, under local anaesthesia, right PPS was established using Pudenz-Heyer ventriculo-peritoneal medium pressure valve (Fig 1). A 12 FG silicone rubber tubing was used in

the pleural cavity. The one way valve was seated on the rib surface to monitor valve function. Right intercostal drain was initially clamped but could be removed after 48 hours. Drainage from the left side decreased rapidly to only 50 ml

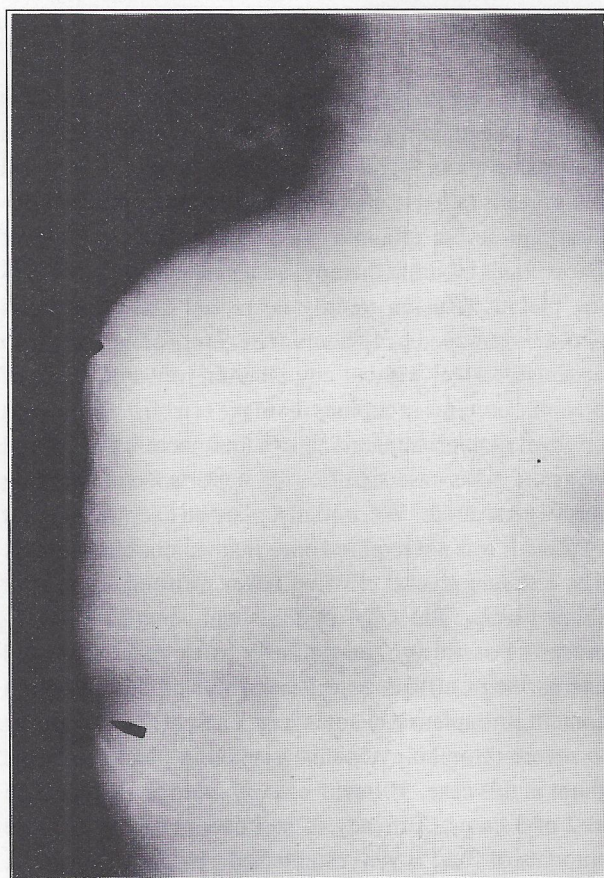


Figure 1: Skiagram showing Pleuro-peritoneal Shunt and absence of pleural effusion on the right side of chest. Upper arrow points to the Pudenz-Heyer Valve and lower arrow towards the intraperitoneal catheter. Intrapleural catheter was not radio-opaque.

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next day and eventually stopped in 48 hours. In the first 24 hours after the shunt operation, abdominal girth increased by 1 cm but returned to preoperative level in 72 hours. The lungs improved, pleural effusion cleared and serum albumin rose to 34.1 gm/L. A little more than a month later mild right pleural effusion was noted secondary to shunt dysfunction that could be rectified by manual pumping. The patient had right intrapleural haemorrhage secondary to severe thrombocytopenia (platelet count 20,000 per cubic mm) and this resulted in permanent shunt blockage 5 days later. Chest X-ray showed moderate pleural effusion on right side only which was not considered to be significant enough to require drainage. Left-sided pleural never recurred.

DISCUSSION

This case highlights the usefulness of PPS. This patient was draining more than one litre pleural effusion and losing about 9 gms of proteins in it daily. Chemical pleurodesis failed to check the production of pleural effusion and serum albumin was always low in spite of intravenous albumin therapy. After establishment of PPS the pleural effusion rapidly decreased and chest tubes could be removed in 48 hours. His serum albumin rose to acceptable level without any albumin infusion. Loss of precious proteins in copious drainage establishes a vicious circle of hypoproteinemia, hypoalbuminemia and pleural effusion. This case signifies the importance of breaking this vicious circle. We, initially, planned to establish a left PPS but it was not required once that vicious circle broke. The left side pleural effusion never recurred, even after shunt block. Blockage of the shunt remains an ever-present possibility, particularly with exudative and haemorrhagic effusions because of high protein and fibrin content. Intrapleural haemorrhage on right side secondary to severe thrombo-cytopenia resulted in blockage of the shunt in this case. Hussain⁴ also reported shunt blockage in 2 of 3 cases. Efficacy of peritoneum to absorb large amounts of fluid is well established. In this case, initial, minimal increase in the abdominal girth returned to normal in 72 hours.

Intractable pleural effusion, whether benign or malignant, is a difficult problem. Usual management in-

cludes repeated thoracentesis, intercostal drain, and chemical or surgical pleurodesis. Repeated thoracentesis and intercostal drain are cumbersome on long term basis and there is always danger of infection and/or loculation. Surgical pleurodesis involving extensive pleurectomy appears to be too big a procedure most of the time, in these moribund patients. Chemical pleurodesis may not produce satisfactory result in all cases. Despite the use of laboratory and interventional investigations the cause of pleural effusion may remain obscure. PPS is a rational approach to deal with such cases. The PPS has been used to manage chylothorax¹ and malignant pleural effusion^{2,3}. There is possibility of malignant implantation in peritoneum with the use of PPS in malignant pleural effusion. But, most of these patients have a short life span and PPS may be worthwhile palliation to improve their quality of life. Raff & Stochlein⁵ have reported successful palliation of malignant ascites by establishing a peritoneal-venous shunt.

In spite of the apparent theoretical and proven advantages this modality of treatment has not been widely used. The PPS need to be used more frequently and early in the course of pleural effusion to exploit its full potential. Patients requiring repeated thoracenteses for whatsoever pathology, particularly with transudative effusion and those requiring intercostal drain for more than two or three weeks should prove ideal candidates for PPS. With more frequent use of PPS, precious body proteins can be greatly saved, morbidity reduced, load on hospital beds decreased and it will help to improve the quality of life of these otherwise miserable patients.

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