

An Unusual Cause for Massive Pleural Effusion

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Clinical Summary

A cerebrospinal (CSF) fluid pleural effusion is a very rare complication following ventriculo-peritoneal shunt. Some cases of CSF pleural effusion have been reported in children.¹⁻⁴ However, very few cases have been reported in adults.^{3,5-9}

A 66-year-old female presented with chief complaints of increased shortness of breath since last two months. There was further worsening of dyspnoea over the last seven days. She was a known case of hypertension since 10 years and on regular treatment. There was a history of placement of ventriculo-peritoneal shunt following sub-arachnoid haemorrhage three years back. On physical examination, diminished breath sounds were observed over the right chest field.

Investigations

Routine haematological and biochemical investigations were within normal limits. Chest radiograph (Figure 1) revealed right-sided pleural effusion with coiled distal end of the tube in the thorax. Diagnostic pleural fluid aspiration showed clear colourless transudative fluid. Analysis of pleural fluid revealed raised beta-2 transferring levels.

Computed tomography (CT) of the chest (Figure 2A, B and C) showed pleural effusion on the right side with shunt tube coursing through subcutaneous tissue of the neck into the anterior mediastinum and further coiling into the right pleural cavity.



Figure 1. Chest radiograph (postero-anterior view) showing right-sided pleural effusion with coiled shunt tube in the thorax.

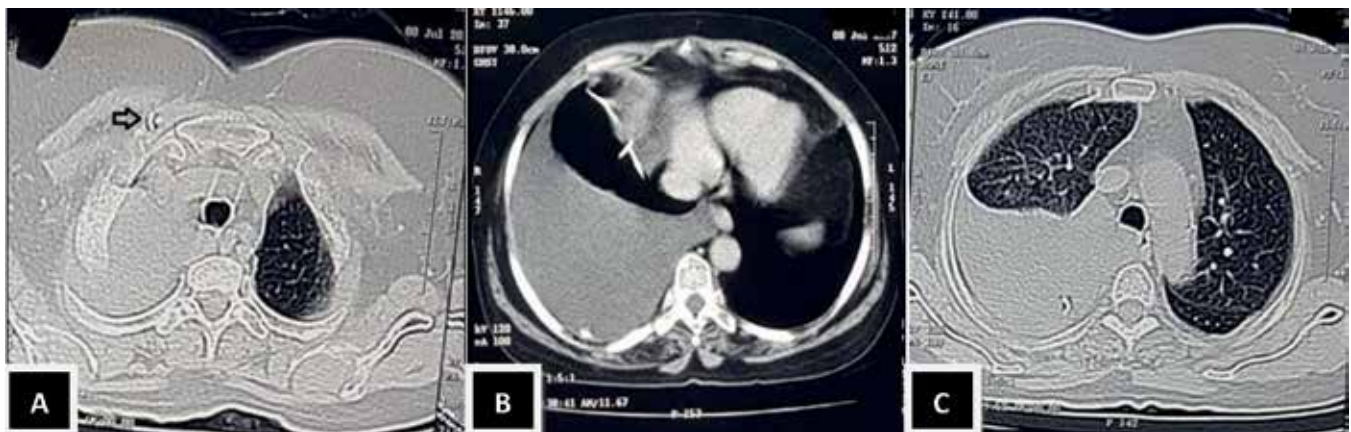


Figure 2. Computed tomography of the chest showing right-sided pleural effusion with shunt tube coursing through subcutaneous tissue of the neck into the anterior mediastinum and further coiling into the right pleural cavity.

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Diagnosis: *Massive cerebrospinal fluid pleural effusion*

Discussion

Ventriculo-peritoneal shunt placement is the procedure used for drainage of cerebrospinal fluid (CSF) to treat hydrocephalus. The basic components of a CSF shunt include a proximal catheter, reservoir, valve, and distal catheter. In general shunt infection and obstruction are the most common complications.⁶ Thoracic complications, though rare, include pleural effusion, bronchial perforation, pneumothorax, and pneumonia. Pleural effusion can occur due to migration of the peritoneal catheter into the chest, however, effusion have also been described in the absence of transthoracic catheter migration. In the absence of catheter migration, effusion is a result of combination of asymptomatic CSF ascites and micro communications in the diaphragm.³ The migration of the peritoneal tip of ventriculo-peritoneal shunt into the chest is either by supra-diaphragmatic or a trans-diaphragmatic route. In supra-diaphragmatic migration, the site of the entry to the chest is an incorrect subcutaneous passage formed during distal tunneling. In trans-diaphragmatic route migration occurs through a congenital diaphragmatic defect.¹⁰ In the present case, migration of the peritoneal tip of ventriculo-peritoneal shunt into the chest was by supra-diaphragmatic route. Cases of CSF pleural effusion have been reported in children. However, very few cases have been reported in adults.

Clinico-pathological analysis can be used to identify CSF in the pleural space. CSF is clear, colourless with low levels of protein and lactate dehydrogenase. Beta-2 transferrin is an isoform of transferrin that is only found in CSF and ear perilymph. It is not found in blood, saliva or lymph, and hence, used as a specific marker of CSF.¹¹ In our case also the aspirated fluid showed low protein and beta transferrin levels were raised.

Management requires revision of the lower end with repositioning the distal end back into the peritoneal cavity. In the present case also patient was referred to department of neurosurgery for further management.

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