Diaphragmatic paralysis is a rare recognized complication of chest tube malposition.\cite{1,2} However, Chilaiditi's sign occurring as a result of this complication has never been reported to the best of our knowledge. Further, most of the previously described cases of diaphragmatic paralysis resulting from malpositioned chest tubes occurred in neonates and children.\cite{1,2} We describe one such adult patient who developed Chilaiditi's sign following chest tube placement, where the medial end of the tube was clearly abutting the mediastinum. This chest tube had been placed for draining a pneumothorax, which occurred following central venous line placement. The report highlights the string of unfortunate iatrogenic incidents in this patient and the interesting radiographic findings.

Case History

A 75-year-old man, presented to our hospital with vomiting, abdominal pain and distension for three days. At presentation the patient was hemodynamically stable and an initial clinical diagnosis of intestinal obstruction was made. The abdominal and chest (Figure 1A) radiographs were done which revealed a raised right hemidiaphragm and air under it, which seemed to be confined within bowel loops suggesting colonic interposition. None of the abdominal bowel loops were dilated.

On probing the prior history further, it was found that the patient had been admitted eight months ago with an episode of severe upper gastrointestinal bleeding. On this occasion he had been hemodynamically unstable and a central venous line had been used via the right subclavian route for hemostabilization. This had led to a significant iatrogenic pneumothorax. A chest tube placement had been done to drain the pneumothorax (Figure 1B). As seen on the chest radiograph done on this occasion the chest tube was "too far in" and the medial end was abutting the mediastinum and had actually turned to lie in the antero-posterior plane. At this stage the right diaphragm was in its normal position. The patient was found to have a bleeding duodenal ulcer, which was treated endoscopically and further by medical management. The patient had been otherwise asymptomatic until the present admission.

During the present admission, it was therefore inferred that the patient had diaphragmatic paralysis resulting from phrenic...
nerve palsy due to the malposition of the chest tube. This may have contributed to hepatodiaphragmatic colonic interposition by creating a potential space in the subdiaphragmatic region. We considered a diagnosis of Chilaiditi’s ‘syndrome’ due to the patient’s presentation. However, the upper gastrointestinal endoscopy, done keeping in mind the previous clinical history, showed a gastric outlet obstruction. This may have resulted from the healed duodenal ulcer seen earlier. This was dilated by endoscopic balloon dilatation and the patient improved considerably and is now doing well.

Discussion

Chilaiditi’s sign can occur due to increased colonic mobility, reduced liver volume, lax suspensory ligaments, obesity and also following phrenic nerve palsy.[3] Only a single case report, highlighting iatrogenic cause of this rare entity has been described previously, which apparently occurred following endoscopy.[4] In this report, however, the mechanism of bowel interposition was explained on the basis of aerophagia as a result of endoscopy, coupled with recent profound weight loss due to progressive dysphagia. It was reversible with bowel decompression.

In our case the clearly malpositioned chest tube may have resulted in its occurrence, by initially causing phrenic nerve palsy. We acknowledge that it is difficult to be absolutely certain that the colonic interposition was caused by phrenic nerve palsy, due to the fact it was not seen on the post chest tube insertion film. It is also notable that most of the previously described cases of diaphragmatic paralysis resulting from malpositioned chest tubes occurred in neonates and children, while ours was an adult patient. In this patient it was finally endoscopically shown that the patient’s present symptoms were probably unrelated to the colonic interposition. Since the cause for the symptoms was due to gastric outlet obstruction, we would prefer to use the term ‘Chilaiditi’s sign’ instead of ‘Chilaiditi’s syndrome’. The case highlights, however, the great care that should be exercised for all procedures undertaken which can sometimes cause a series of unfortunate iatrogenic incidents that can potentially cause delayed manifestations. In their report, Nahum et al.,[2] suggest that the radiologists should notify the physicians that the correct position of a chest tube tip is at least 2 cm distant from the spine. We would strongly endorse this suggestion, particularly because chest tube placement is a commonly done procedure and a complication like this is entirely avoidable.

References
