European Journal of Radiology Extra 71 (2009) e131–e134

Contents lists available at ScienceDirect

European Journal of Radiology Extra

journal homepage: intl.elsevierhealth.com/journals/ejrex

Thoraco-abdominal pneumorrhachis following pneumomediastinum, pneumoretroperitoneum, cervical, thoracic and abdominal wall subcutaneous emphysema after retroduodenal perforation: Case report of a rare radiologic finding

Malay Sharma*, Shubham Garg[1], Sanjay Gupta[2]

Jaswant Rai Speciality Hospital, Gastroenterology, Meerut, Uttar Pradesh 250001, India

ARTICLE INFO

Article history:
Received 23 March 2009
Accepted 3 April 2009

Keywords:
Contrast enhanced computerized tomography scans
Pneumorrhachis
Pneumoperitoneum
Pneumomediastinum

ABSTRACT

Pneumorrhachis (PR) is an under-diagnosed phenomenon delineating existence of intraspinal air. We report a case in which extradural PR developed along with pneumoretroperitoneum, pneumomediastinum, cervical, thoracic and abdominal wall subcutaneous emphysema after retroduodenal perforation following ERCP. ERCP was done to evaluate obstructive jaundice in a 62-year-old male following which patient developed abdominal pain and crepitus in the body wall. Computerized tomography scan revealed extradural pneumorrhachis of thoraco-abdominal spinal canal with presence of air in the body cavities. The patient remained however neurologically asymptomatic and recovered with conservative management over the next few days. We have also studied the available literature and presented a pathway of air dissection from the body cavities to the epidural space.

1. Introduction

Pneumorrhachis (PR) is an under-diagnosed phenomenon delineating existence of intraspinal air [1]. It is generally asymptomatic, identified on computerized tomography (CT) scans [2] and commonly represents coincident underlying diseases or injuries. The air found in PR is associated either with air distribution in cavities of the body like pneumothorax [3], pneumomediastinum or trauma to the spine [4].

Asymptomatic PR does not tend to migrate and reabsorbs spontaneously and completely with the nitrogen of the air being passed directly into blood over a period of several days without recurrence [5]. The reabsorption of the air in PR with high nitrogen content (92%) [6] is facilitated by high concentration oxygen therapy [7]. We report a case in which extradural PR developed along with pneumoretroperitoneum, pneumomediastinum, cervical, thoracic and abdominal wall subcutaneous emphysema after retroduodenal perforation following ERCP.

2. Case report

A 62-year-old male presented with obstructive jaundice. Abdominal ultrasound revealed a mass in the lumen of the gallbladder and dilated common bile duct due to obstruction at the lower end by a lymph node. Following ERCP and stenting (10 french plastic stent) the patient developed abdominal pain and crepitus in neck and thoraco-abdominal wall. Computerized tomography scan revealed pneumomediastinum, pneumoretroperitoneum, cervical, thoracic and abdominal wall subcutaneous emphysema with extradural pneumorrhachis of thoraco-abdominal spinal canal (Figs. 1 and 2A). The air shadow was in continuity with the air present behind the psoas sheath and extended through the intervertebral foramina of the right side into spinal canal (Fig. 2A–D).

The patient was shifted to the Intensive Care Unit. He was managed conservatively with bowel rest, intravenous fluids and antibiotics and he recovered within 5 days. High flow oxygen therapy was also given for 2 days. The patient had no neurologic symptoms during the entire hospitalization.

3. Discussion

We have shown extensive pneumorrhachis following pneumoretroperitoneum, pneumomediastinum, and subcutaneous emphysema after retroduodenal perforation for the first time [8].

The reported explanation for air in PR is that the gas collected in the clefts of a long-standing diseased disc and is expulsed by a "valve

Abbreviations: PR, pneumorrhachis; CECT, contrast enhanced computerized tomography; ERCP, endoscopic retrograde cholangio pancreatography.

* Corresponding author. Tel.: +91 9837031148 (mobile).
E-mail addresses: sharmamalay@hotmail.com (M. Sharma), shubhamgarg84@gmail.com (S. Garg), sanjayricon@yahoo.co.in (S. Gupta).
[1] Tel.: +91 9639787538 (mobile).
[2] Tel.: +91 9412201491 (mobile).

1571-4675/$ – see front matter © 2009 Elsevier Ireland Ltd. All rights reserved.
doi:10.1016/j.ejrex.2009.04.005

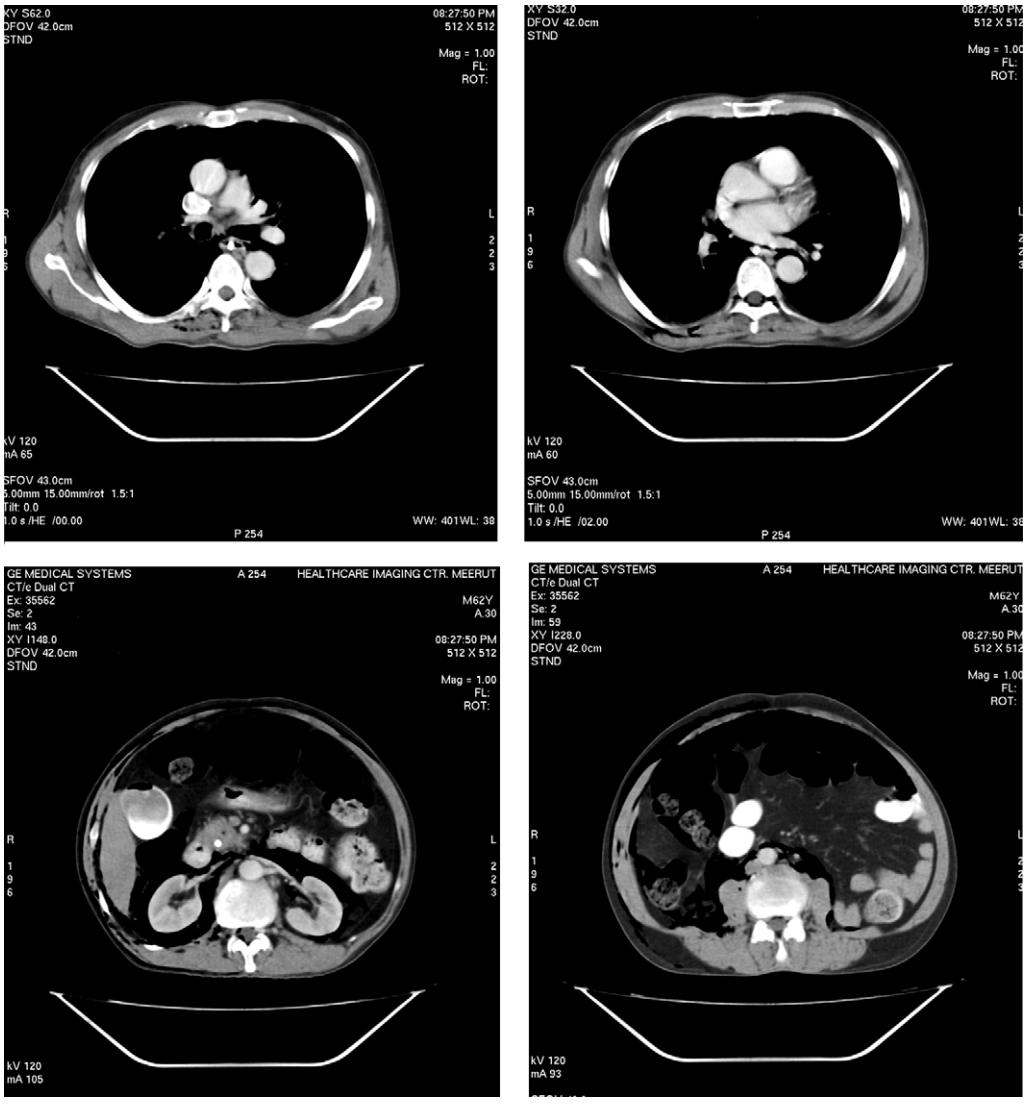

Fig. 1. Contrast enhanced computerized tomography scans showing epidural pneumorrhachis in thoracic and sacral spinal cord. The presence of air in the subcutaneous space is visible along the body wall. The abdominal CT scans also show retropneumoperitoneum.

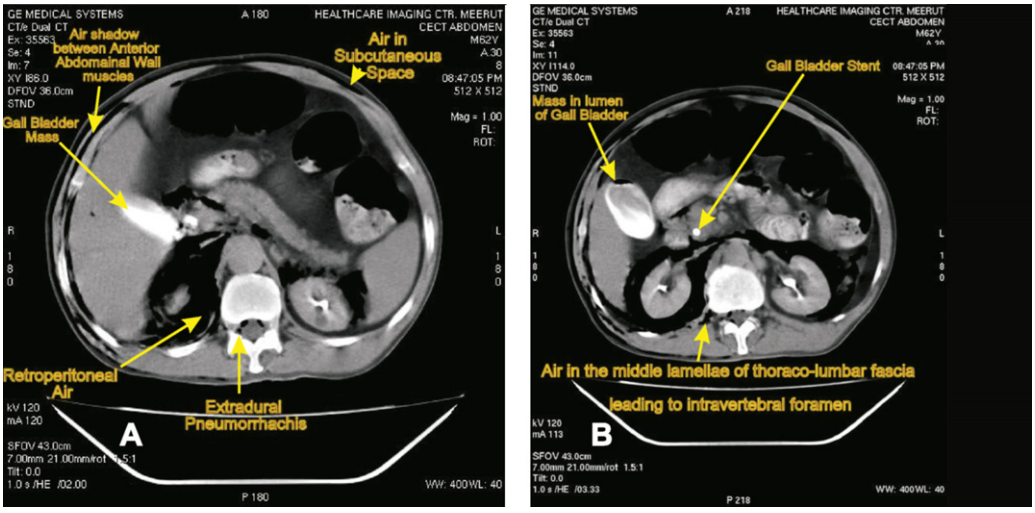

Fig. 2. (A) Contrast enhanced CT scans show air shadow is seen in the retroperitoneal space and in the epidural space of the spinal canal. It is also seen in the subcutaneous layers of the body wall. (B) A mass is seen in the lumen of the gall bladder and the common bile duct stent is shown. Air shadow is seen in the middle lamellae of the lumbar fascia between quadratus lumborum and erector spinae muscle (C). The intervertebral disc is shown and no degenerative changes, air bubbles are visible. (D) The path of air is shown from the pararenal space, between psoas major and quadratus lumborum, intervertebral canal to the epidural space of the spinal canal. Correlate with (A).