

An Unusual Case Of Tension Pneumo-Peritoneum Causing Tension Pneumothorax And Pneumomediastinum After Augmentation Gastrocystoplasty

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Citation

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Abstract

The coexistence of tension pneumoperitoneum and pneumothorax is a rare occurrence. The persistence of pneumothorax despite chest tube thoracostomy should raise suspicion of underlying pneumoperitoneum particularly in a post gastrocystoplasty patient. The initial management of such patient should be directed towards urgent treatment of tension pneumothorax. The definitive management would require identifying its aetiology and treating the underlying pneumoperitoneum.

INTRODUCTION

Tension pneumoperitoneum is a rare but recognized surgical emergency. [1] The incidence of tension pneumo-peritoneum has been associated with perforated hollow viscus, cardiopulmonary resuscitation, high intermittent positive pressure ventilation (IPPV) for adult respiratory distress syndrome (ARDS) [2], laparoscopic [3] and urological procedures [4]. Our report illustrates an unusual case of tension pneumoperitoneum presenting together tension pneumothorax and pneumomediastinum, which occurred following gastrocystoplasty and left nephrectomy for tuberculosis cystitis.

CASE REPORT

A 40 year old gentleman underwent an elective left nephrectomy, splenectomy and augmentation gastrocystoplasty with re-implantation of right ureter for a non-functioning fibrotic bladder and left kidney secondary to genito-urinary tuberculosis. His past medical history included old pulmonary tuberculosis, which was treated. He also had chronic renal failure secondary to ureteric stricture resulting from chronic genitourinary tuberculosis. Previous attempt to correct this ureteric stricture with surgical dilatation and re-implantation of right ureter was unsuccessful.

Intra-operatively, a gastric segment supplied by left gastro-epiploic artery was isolated and mobilized into the pelvis as the gastric neobladder while the distal end of right ureter was re-implanted into the neobladder. A truncal vagotomy was

performed and continuity of upper gastrointestinal tract was restored with a Bilioth type I gastroduodenostomy.

The patient's post-operative recovery was uneventful until day 12 when he complained of dyspnoea and left upper quadrant abdominal distension. Respiratory examination revealed absent breath sounds on the left, hyper-resonant percussion associated with subcutaneous emphysema causing respiratory compromise. The initial X-ray report showed pneumo-mediastinum and tension pneumothorax. (X-ray 1) A chest tube was inserted with partial relief of symptoms, however the symptoms of abdominal distension persisted. (See X-ray 2)

Figure 1

Chest radiograph 1: left pneumothorax (closed arrow) with pneumomediastinum. Trachea deviation with mediastinum shift. Large amount of free subdiaphragmatic free air. (Dashed arrow)

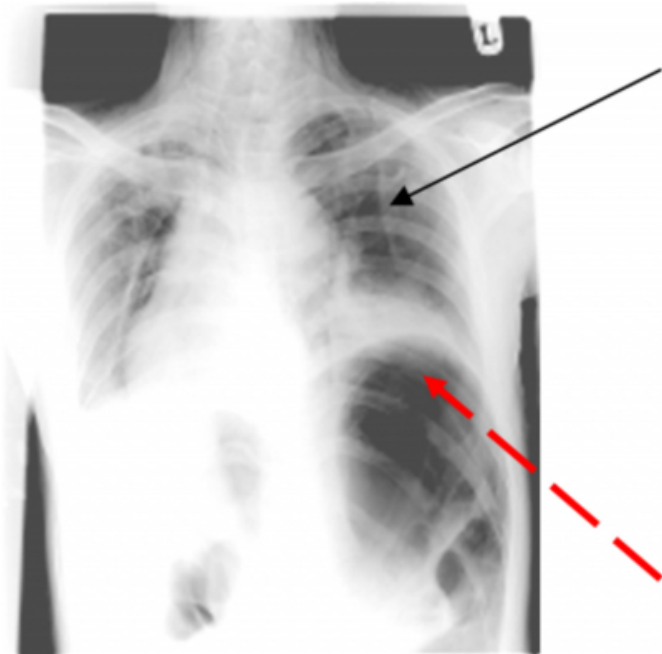


Figure 2

Chest radiograph 2: chest tube inserted with decrease in size of pneumothorax.



Figure 3

CT 1: Large amount of intraperitoneal free air.

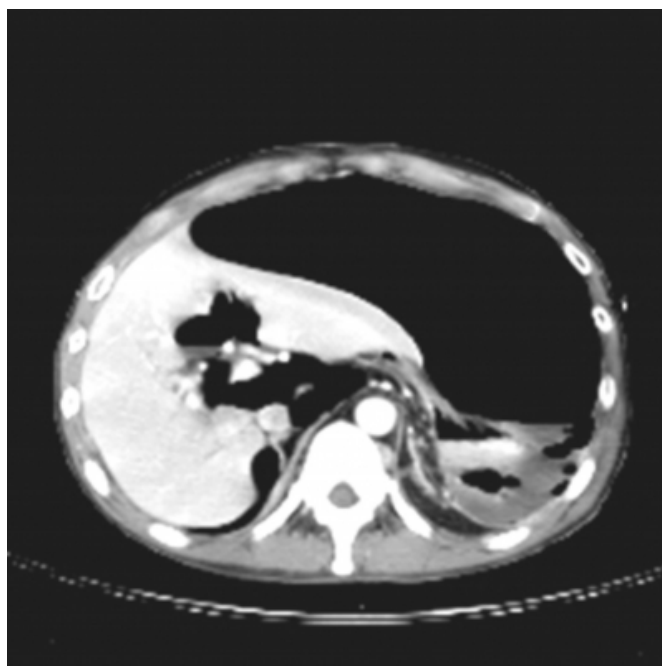
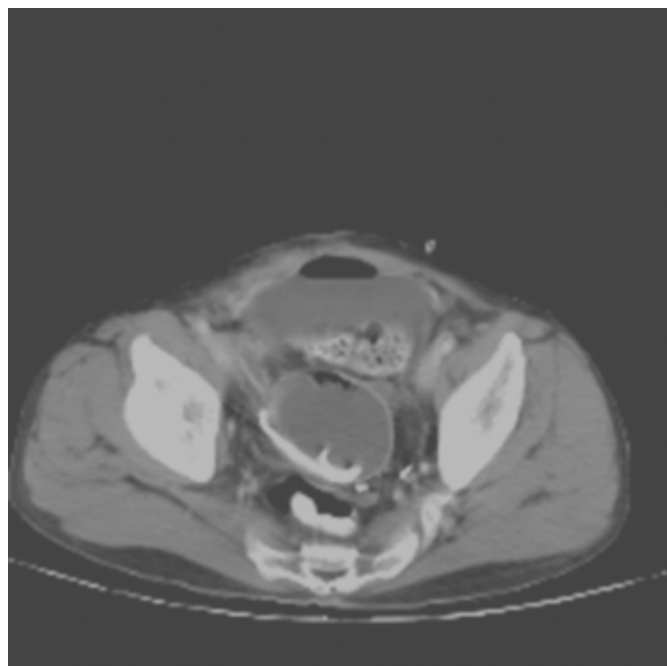


Figure 4

CT 2: Loculated collection posterior to neobladder.



The following day, he developed progressive left sided abdominal distension and a low-grade temperature. An abdominal-pelvis computerised tomography scan showed extensive free air associated with 3 pockets of loculated fluid collection in the right subphrenic space, paracolic gutter and the suprapubic region suggestive of a perforated viscus. See (CT1 and CT2)

An urgent laparotomy was arranged and the intraoperative findings were that of a perforation at the transverse colon with minimal soilage, a collection of free air in the left upper quadrant and multiple dense adhesions. The perforation was treated by converting it into an enterocutaneous fistula due to the difficulty in mobilizing the transverse colon. The fistula was managed conservatively with somatostatin. Post operatively, he made an uneventful recovery and the fistula was closed surgically 6 months later.

DISCUSSION

The phenomenon of tension pneumothorax and pneumomediastinum secondary to tension pneumoperitoneum is an unusual cause of acute respiratory distress. Literature review involving medline showed that tension pneumothorax and tension pneumoperitoneum has not been described in patients after augmentation gastrocystoplasty.

The diagnosis of a pneumoperitoneum causing tension pneumothorax can be suspected clinically although an erect chest radiograph for sub-diaphragmatic free air can be a useful adjunct in detecting the presence of hollow viscus perforation. The sensitivity of an erect chest radiograph however depends on the length of time for absorption of post laparotomy pneumoperitoneum as intra-abdominal free air may persist up to 10 days in 7% of post laparotomy patients. [5] The presence of free air 12 days post-operatively in this patient should raise the suspicion of perforated viscus.

The nature of the augmentation gastrocystoplasty involves a truncal vagotomy, which involves dissection of the oesophageal hiatus, to identify the vagal nerve. This may serve as a conduit for intra-peritoneal for migration of free air into the mediastinum. [3] The presence of a valve like mechanism around the oesophageal hiatus has been postulated in the aetiology of pneumo-peritoneum causing secondary pneumothorax. [6] This valvular mechanism allows the escape of intra-peritoneal free air into the intrathoracic cavity but not the reflux of air into the peritoneum, hence contributing to progressive respiratory compromise.

As demonstrated, the tension pneumothorax did not resolve completely despite tube thoracostomy. This illustrates a crucial point in the management of this condition i.e. if the pneumothorax persisted despite insertion of chest thoracostomy, an alternative source of free air should be sought. The management of this patient should be directed at repairing the source of air leakage i.e. the perforated transverse colon after initial stabilization of patient's condition. This required a laparotomy to decompress the abdomen and to repair the perforation.

CONCLUSION

The possibility of coexistence of both life-threatening conditions required a high vigilance especially in the setting of a post-operative patient. An erect chest radiograph is a useful investigation in detecting free sub diaphragmatic free air, although its sensitivity may be limited in post-laparotomy patients. The persistence of tension pneumothorax, which did not resolve despite tube thorocostomy should allude to the presence of an intra-abdominal free air particularly in patient who had recently underwent a major intra-abdominal operation. The initial management of the tension pneumothorax should take precedence over exploratory laparotomy for perforated viscus.

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