

Pneumomediastinum as a Complication of Preperitoneal Laparoscopic Herniorrhaphy

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ABSTRACT

Background: As new approaches to herniorrhaphy are popularized, new complications are being encountered. Pneumomediastinum is one such complication.

Methods: We present a patient who developed pneumomediastinum after an elective bilateral preperitoneal laparoscopic hernia repair.

Results: The patient was observed and discharged 24 hours later with no permanent sequelae.

Conclusion: Pneumomediastinum is a rare complication of laparoscopic hernia repair.

Key Words: Laparoscopy, Herniorrhaphy, Pneumomediastinum.

INTRODUCTION

As newer approaches to inguinal hernia repair are performed, newer complications of these techniques are being encountered. Laparoscopic approaches to inguinal hernia repair have been described with equivalent short-term recurrence rates as those of open approaches.¹⁻³ Although the role of laparoscopic hernia repair has yet to be defined, decreased postoperative patient pain and quicker return to normal activity are potential advantages associated with laparoscopic herniorrhaphy. Various investigations have demonstrated superior results of the preperitoneal approach to the transabdominal approach.

Many thoracic complications of laparoscopic surgery have been reported including pneumothorax, pneumomediastinum, pneumopericardium, and subcutaneous emphysema. Below, we describe a rarely reported complication of pneumomediastinum after preperitoneal laparoscopic inguinal hernia repair. Although this may be an uncommon complication, surgeons performing laparoscopic herniorrhaphy should recognize it.

CASE REPORT

A 64-year-old male with no past medical or surgical history presented to our clinic with bilateral inguinal hernia and desired laparoscopic repair. He was taken electively to the operating room for a standard bilateral laparoscopic preperitoneal hernia repair. Intraoperatively, a balloon dissector was used to create a preperitoneal space. With a maximum pressure of 12 mm Hg, the preperitoneal space was insufflated with CO₂. Dissection revealed bilateral direct defects. Two separate but overlapping 10-cm x 15-cm pieces of polypropylene mesh were placed and tacked appropriately. No obvious tears occurred in the peritoneum nor did any evidence exist of pneumoperitoneum during the procedure. Before all the ports were removed, 0.25% bupivacaine hydrochloride was placed in the preperitoneal space for postoperative analgesia. No elevation of end-tidal CO₂ was observed during the procedure.

In the recovery room, the patient complained of substernal chest pain. A chest radiograph (**Figure 1**) demonstrated a pneumomediastinum. EKG and subsequent car-

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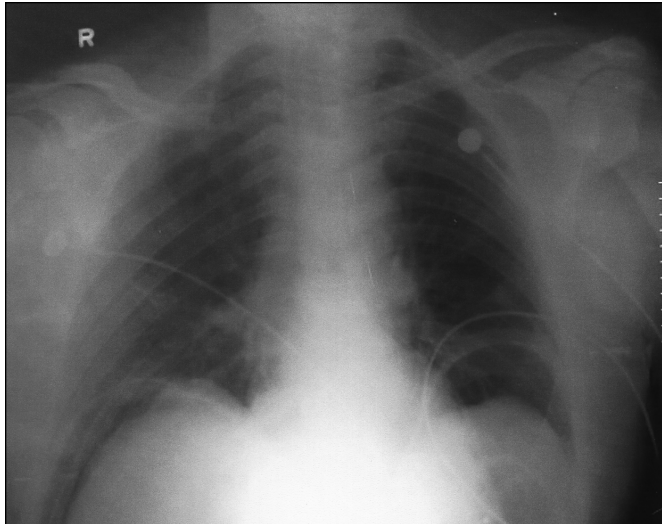


Figure 1. The postoperative chest radiograph demonstrates pneumomediastinum.

diac enzymes were normal. The patient was monitored with continuous pulse oximetry and cardiac monitoring overnight with no desaturation or arrhythmia noted. His chest pain resolved with 1 dose of intravenous narcotics and he then required only oral analgesics. He was discharged the next morning. One week later, the patient was without any complaints. One month later, the patient remained asymptomatic with no recurrence of his hernias.

DISCUSSION

In relatively recent years, laparoscopic inguinal hernia repair became popular because of the shorter time needed to return to work and the decreased postoperative pain. Another benefit of laparoscopic inguinal herniorrhaphy is the ability to perform a bilateral repair with the same incisions used for a unilateral repair. Also, the surgeon is able to relatively easily diagnose and repair asymptomatic contralateral hernia during unilateral repairs in the hope of avoiding future hernia operations.

Our patient had an uncommon complication of preperitoneal inguinal hernia repair. Although pneumomediastinum has been reported before,^{4,5} the actual incidence is unknown because postoperative chest radiographs are not and should not be routine after any type of hernia repair. In the situation in which an asymptomatic patient is found to have a pneumomediastinum, deviation from

routine postoperative care is not necessary. However in the symptomatic patient, observation and appropriate monitoring is strongly recommended.

Pneumomediastinum can occur via air from the esophagus, trachea, bronchi, lung, neck, abdomen, or retroperitoneal space. The most likely source in our case was the abdomen because a pneumoperitoneum is present on the chest radiograph (**Figure 1**). An inadvertent tear in the peritoneum was the most likely culprit. Pneumomediastinum can occur after laparoscopic abdominal procedures although this is rare.⁶⁻⁹ The air can enter around the esophageal and aortic hiatus. In fact, after paraesophageal hernia repair with or without fundoplication, pneumomediastinum (secondary to surgical dissection through the esophageal hiatus) has been considered a normal postoperative finding because it is present in 18% of patients.⁸

The only 2 previous cases of pneumomediastinum after preperitoneal laparoscopic hernia repair required prolonged ventilatory support for the patient.^{4,5} Ramia et al⁴ reported an instance of a tear in the peritoneum that was noted and closed. Postoperatively, the patient developed chest pain and oxygen desaturation along with subcutaneous emphysema of the neck. After 2 hours of ventilatory support, their patient was extubated and discharged 2 days later. Browne et al⁵ reported a case in which extensive subcutaneous emphysema involving the scrotum, abdomen, thorax, and neck was observed postoperatively. Pneumomediastinum and a left pneumothorax were noted on a chest radiograph. A thoracostomy tube was placed and the patient was extubated the next morning. After thoracostomy tube removal, the patient was discharged.

Although these 2 patients required prolonged mechanical ventilation, this is not always necessary as demonstrated by our own case. In patients without respiratory distress or with no upper airway compromise and who are hemodynamically stable with appropriate oxygen saturations, careful monitoring is all that is necessary for isolated pneumomediastinum. Of course, a chest radiograph is needed to diagnose other associated problems like pneumothorax.^{10,11}

CONCLUSION

Pneumomediastinum is a rare complication of laparoscopic preperitoneal inguinal hernia repair, which poten-

tially prolongs hospital stay and thereby increases total costs. Early diagnosis and appropriate treatment are necessary to avoid serious problems. However, as an isolated finding, pneumomediastinum may only require careful monitoring.

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