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## Case Report

# Bilateral Pneumothorax After Extraperitoneal Laparoscopic Radical Prostatectomy

SAM B. BHAYANI, MD, and LORI E. STEINNERD, RN

### ABSTRACT

**A known complication of laparoscopic surgery is pneumothorax. Most reported pneumothoraces occur during laparoscopic transperitoneal abdominal surgery. Clinically significant pneumothorax from pelvic extraperitoneal surgery has not been reported. In this paper, we describe symptomatic bilateral pneumothorax following a totally extraperitoneal radical prostatectomy. The management of the complication is also discussed.**

### INTRODUCTION

**L**APAROSCOPIC AND ROBOTIC PROSTATECTOMY has become an alternative to the traditional open radical prostatectomy approach.<sup>1,2</sup> These surgeries may be performed by an extraperitoneal laparoscopic approach, thus possibly avoiding the complications of the pneumoperitoneum. Although pneumothorax has been widely reported with transperitoneal laparoscopy,<sup>3,4</sup> symptomatic pneumothorax has not been reported from the extraperitoneal pelvic laparoscopy procedure. In this paper, we report a case of symptomatic bilateral symptomatic pneumothorax associated with totally extraperitoneal pelvic laparoscopic surgery.

### CASE HISTORY

A 52-year-old male, ASA 2, 177.8 cm in height and weighing 121.56 kg, and with cancer of the prostate, underwent a laparoscopic radical prostatectomy and bilat-

eral lymphadenectomy. A purely extraperitoneal approach was used and the case was uncomplicated, with an estimated blood loss of 150 cc. Insufflation pressure was 15 mm Hg throughout the case and the procedure time was 176 minutes. In the Recovery Room, it was noted that the patient had low oxygen saturation levels. An arterial blood gas was obtained, which revealed a pH of 7.28, a pO<sub>2</sub> of 61, and a pCO<sub>2</sub> of 59. A chest X-ray was performed in the Recovery Room, which showed bilateral apical pneumothoraces. A chest computed tomography was performed to rule out aspiration or pulmonary embolism, and it, too, revealed bilateral pneumothoraces with pneumomediastinum (Fig. 1). The patient required 100% oxygen by face mask to maintain saturations above 92%. Consideration was given to a bilateral tube thoracostomy; however, over the next 1–2 hours, oxygen requirements gradually decreased. Follow-up chest radiography revealed an improvement and resolution of pneumothoraces over the next 2 days. The final pathology was organ-confined prostate cancer, stage pT2cN0M0, with margins negative.



**FIG. 1.** A computed tomography scan of a patient with bilateral pneumothoraces.

## DISCUSSION

Pneumothorax is an uncommon complication of the laparoscopic surgery procedure.

Pathophysiologically, most reported cases are from transperitoneal laparoscopic surgery, in which congenital pleuroperitoneal pathways are the likely culprit.<sup>5</sup> Upper retroperitoneal laparoscopic surgery may be associated with diaphragmatic trauma and, consequently, pneumothorax. The pathophysiology of pneumothorax associated with pelvic extraperitoneal surgery has not been well defined, but may be from dissection through musculofascial planes into the mediastinum, and then the subsequent rupture into the pleural cavities.<sup>6</sup> Conservative management was adequate in this case, but tube thoracostomy should nonetheless be entertained in any case. This case illustrated a critical point with regard to laparoscopic surgery of the pelvis versus open surgery of the pelvis. The initial clinical suspicion was for a pulmonary embolism, which is a somewhat common complication of open pelvic cancer surgery. Nevertheless, a

radiographic evaluation proved that the complication was related to the laparoscopic approach. It is likely that carbon dioxide tracked through muscle or fascial planes, perhaps along the great vessels or retroperitoneum, into the mediastinum and then into the pleural spaces. None of the chest radiographs revealed air in the peritoneal cavity; hence, the complication was exclusively an extraperitoneal process.

## CONCLUSIONS

Consideration of pneumothorax should be given in all cases of respiratory distress following laparoscopic surgery, including the extraperitoneal pelvic space.

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