

## Case Report

# Massive Subcutaneous Emphysema and Bilateral Pneumothorax after TISSEEL Spray in Laparoscopic Surgery

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### 1. Case Report

A 33 years old female without systemic disease received laparoscopic ovarian cystectomy and chromotubation. The operation time was 60 minutes. During the surgery, the intraabdominal pressure was limited between 12 and 15 mmHg. The ETCO<sub>2</sub> was about 35 mmHg and the airway pressure was about 22 cm H<sub>2</sub>O. At the end of operation, TISSEEL [Fibrin Sealant] was delivered by TISSEEL spray set with piped air. The intraabdominal pressure suddenly rose above 20 mmHg, and the peek airway pressure exceeded 40 mmHg. Massive emphysema extending to the face and neck were noted, and bilateral pneumothorax were also found (Figure 1) There were some petechia over her chest. She was transferred to SICU and the condition was relatively stable. She was discharged uneventually after one week.



**Figure 1:** Massive emphysema extending to the face and neck.

## 2. Discussion

Subcutaneous emphysema, and pneumothorax are documented complications of laparoscopic techniques. Murdock et al. found incidence rates of 2.3% for significant subcutaneous emphysema, and 1.9% for pneumothorax/pneumomediastinum following laparoscopic approach [1]. Asymptomatic subcutaneous emphysema can even be detected in up to 56% cases received laparoscopic surgery [2]. The risk factors for subcutaneous emphysema are improperly placed trocar, surgical time longer than 200 minutes, six or more surgical ports, and high intraabdominal pressure [3]. Hypercarbia was noted due to increased CO<sub>2</sub> absorption from the subcutaneous layer. Usually, it will resolve spontaneously with conservative treatment and oxygen therapy.

Pneumothorax is a rare but much vital complication during laparoscopic surgery. It may occur in case of barotrauma from positive pressure mechanical ventilation, direct injury to the diaphragm, defects of the diaphragm, congenital weak points of the diaphragm, or through anatomical pathways, i.e. aortic and esophageal hiatuses of the diaphragm [4]. Increased airway pressure and end tidal CO<sub>2</sub>, unexplained hypoxia, hypercarbia, or hemodynamic instability may ensue [5].

In our case, misuse of TISSEEL spray set led to an abrupt increase in abdominal pressure. It caused barotrauma and thence severe pneumothorax. In order to avoid complications, tightly following device instruction is needed. Close monitoring the change of intra-abdominal and airway pressure could help us to detect the development of pneumothorax earlier. In conclusion, we should always beware of the possibility of serious complications like this case during or after the laparoscopic surgery.

## References

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