CASE REPORT

Thoracoscopic Patch Repair of Congenital Diaphragmatic Hernia in a Neonate using Spiral Tacks: A Case Report

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ABSTRACT

We present a case of congenital diaphragmatic hernia that was successfully treated with spiral tacks using thoracoscopy. A newborn female was diagnosed with a diaphragmatic hernia at 20 weeks of gestation. The defect was surgically repaired by thoracoscopy and primary closure. On postoperative day 25, she developed respiratory distress. Chest x-ray showed a recurrence and was taken to the OR for surgical repair with spiral tacks.

Key words: Diaphragm, Thoracoscopy, Congenital diaphragmatic hernia

CASE REPORT

A Hispanic female, weighing 3040 g and antenatally diagnosed as right congenital diaphragmatic hernia, was born via caesarian section at 37 weeks gestation. Apgar scores were 7 and 8 at 1 and 5 minutes after birth, respectively. Few minutes after birth, she required endotracheal intubation for respiratory distress. A chest x-ray showed herniation of the liver and intestinal loops. Echocardiography showed a patent ductus arteriosus and pulmonary hypertension. After initial stabilization, a thoracoscopic repair (primarily closure with polyglactin) was performed. The patient was extubated at post-op day 8. At post-op day 25, the patient developed acute respiratory distress. Chest x-ray showed a recurrence and she was taken back to the OR. At thoracoscopy, disruption of the previously placed sutures was noticed. The recurrence was successfully repaired using a 5 x 5 cm polypropylene patch that was fixed to the costal margins and diaphragm with sutures for orientation and 12-spiral titanium tacks (ProTack ™ 5mm, Covidien, New Haven, CT). A chest tube was placed (Fig. 1 & 2). The postoperative recovery was uneventful. She is doing fine at three years follow-up with stable repair as shown by the position of tacks. (Fig. 3)

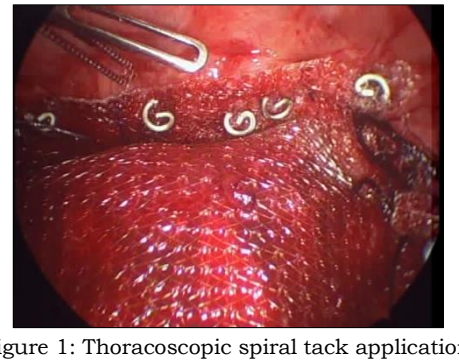

Figure 1: Thoracoscopic spiral tack application

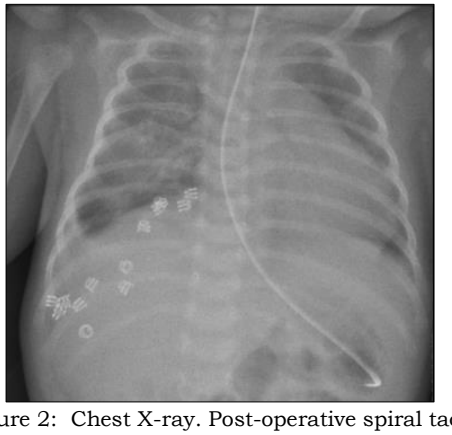

Figure 2: Chest X-ray. Post-operative spiral tack application

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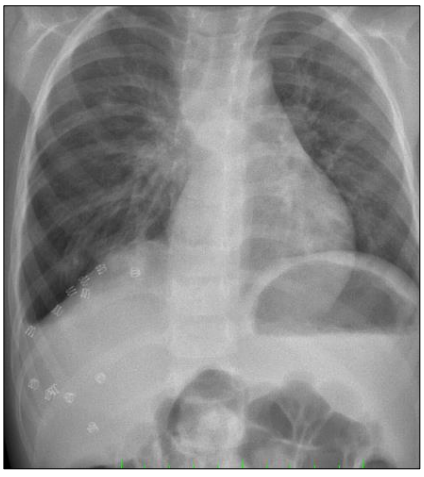

Figure 3: Chest X-ray. Three-year follow-up

DISCUSSION

In small defects, primary closure with non-absorbable sutures is warranted, whereas for larger defects, prosthetic or muscular patches have been recommended. Regardless of the technique, the defect should be closed without tension.[1] Several materials have been proposed with similar results: PTFE, polypropylene, silicone, and bovine collage. Most authors recommend securing the patch to the postero-lateral aspect of the defect and fixing it to the ribcage. Recent results from a meta-analysis showed a higher recurrence rate after MIS and a subgroup of the analysis indicated higher recurrence for repairs with patch. Also, operative time was longer for MIS but postoperative mortality was higher after open surgery. [2]

Factors that may cause recurrence include: type of patch, fixation technique, intra-abdominal pressure and excessive tension on closure, usually related to size of the defect and available adjacent tissue and prosthetic patch size. We hypothesize that the chest wall and diaphragmatic movement influence the stability of the sutures translating into failure in primary closure of the defect. There are multiple publications on the use of tacks to prevent recurrences and achieve better mesh fixation in ventral and inguinal hernia repair. [3]

In this case, we used a mesh and spiral tacks to repair the recurrent defect without any adverse effects. We recommend using tacks as an alternative to repair defects in patients with CDH. Metal tacks have the advantage of being easier to identify on a plain radiograph and monitor mesh integrity.

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