



# Laparoscopic suture repair of idiopathic gastric perforation in Duchenne muscular dystrophy

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## ABSTRACT

We report herein an adolescent case of Duchenne muscular dystrophy (DMD) with idiopathic gastric perforation, in which emergency surgical repair was performed laparoscopically. A 14-year-old nonambulatory boy with DMD was brought to our emergency department with sudden onset of severe abdominal pain and distention. Plain radiograph and computed tomography confirmed the presence of free intraperitoneal air and intrapelvic effusion. The patient elected to undergo laparoscopic inspection with 4 trocars, revealing a focal perforation, 3-4 cm in diameter, on the upper gastric body near the diaphragm. The stomach was also found to have a thin wall without evidence of peptic ulcer disease or other abnormalities. An interrupted suture was placed using 4-0 PDS. The abdomen was extensively irrigated, and multiple J-Vac drains were left *in situ*. Total operation time was 90 min, and no intraoperative complications were encountered. Enteral feeding through a nasogastric tube was started on postoperative day 7. The postoperative course has been uneventful as of the 12-month follow-up. Pediatric surgeons should be aware of the increased risk of gastric perforation associated with DMD, and that laparoscopic repair can be safely performed even in emergency settings.

**Key words:** Duchenne muscular dystrophy, gastric perforation, laparoscopic repair

## INTRODUCTION

Duchenne muscular dystrophy (DMD) is a fatal X-linked recessive disease, and the most common congenital neuromuscular disorder of children.<sup>[1]</sup> Dystrophic

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changes in the smooth muscle of the gastrointestinal tract have been implicated as a cause of gastrointestinal dysfunction.<sup>[2]</sup> We report on an adolescent case of DMD with idiopathic gastric perforation, in which we performed emergency surgical repair laparoscopically.

## CASE REPORT

A 14-year-old nonambulatory boy with DMD was brought to our emergency department with sudden onset of severe abdominal pain and distention. Complaints had been present for 5 h before he was transferred to our hospital, body temperature was 38.8°C, and he was tachycardic (heart rate, 130-150 beats/min). Systolic blood pressure was 70-80 mmHg. The associated risks of perioperative pulmonary dysfunction and cardiac failure in this patient were thus considered high. Plain radiography of the abdomen demonstrated free intraperitoneal air, and computed tomography also confirmed the presence of free intraperitoneal air and intrapelvic effusion [Figure 1]. The patient elected to undergo laparoscopic inspection to search for possible perforations in the digestive tract. Emergent inspection with 4 trocars, including one for suction and irrigation, revealed a focal perforation 3-4 cm in diameter on the fundus of the upper gastric body, near the diaphragm [Figure 2]. The stomach was also found to have a thin wall without evidence of peptic ulcer disease

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or other abnormalities. An interrupted suture, using 4-0 PDS, was placed using an extra-corporeal knot-tying technique [Figure 3]. The abdomen was extensively irrigated, and 3 BLAKE drains were left *in situ*. Total operation time was 90 min, with only 3 ml of blood loss recorded, and no intraoperative complications were encountered. The early postoperative course was uneventful. A gastrografin study was performed on postoperative day 7, showing no leakage and complete closure of the gastric suture [Figure 4]. Enteral feeding through the nasogastric tube was then started. All drains were removed by postoperative day 9. The patient was discharged from hospital in a stable clinical condition on postoperative day 12, and as of the 12-month follow-up, remains alive and symptom-free.

## DISCUSSION

The involvement of smooth muscle in addition to progressive dystrophic changes in striated muscle may cause clinical dysfunction of the gastrointestinal tract.<sup>[2,3]</sup>

To the best of our knowledge, however, few reports have described gastric perforation as a complication in DMD. Dinan *et al.*<sup>[4]</sup> reported the case of a 20-year-old man with DMD who underwent total colectomy for recurrent intestinal pseudo-obstruction and sigmoid volvulus, and postoperatively, the tip of the nasogastric tube was found to be abutting the greater curvature of the gastric body, which had been closed in emergent laparotomy. Brinkman *et al.*<sup>[5]</sup> reported the case of a 26-year-old man with DMD showing acute perforating gastroduodenal peptic ulcer, which was treated nonoperatively with nasogastric suction and intravenous medication. Multiple gastric perforations have also been reported in the pathology literature as a cause of death in a patient with DMD.<sup>[6]</sup> This is the first report of safe laparoscopic repair for idiopathic gastric perforation associated with adolescent DMD, with interrupted sutures placed in an emergency setting. In summary, pediatric surgeons should be aware of the increased risk of gastric perforation associated with DMD because of the thinning and increased fragility of

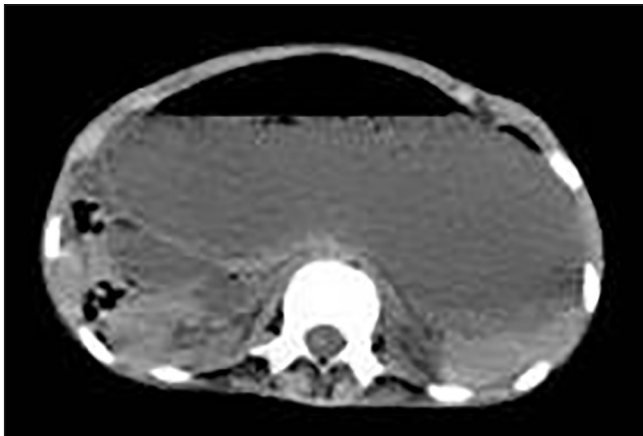


Figure 1: Preoperative abdominal computed tomography (CT) Abdominal CT confirm the presence of free intraperitoneal air and intrapelvic effusion



Figure 2: Laparoscopic view of the gastric perforation. Perforations (arrowheads) are present in the anterior wall of the upper stomach near the fundus



Figure 3: Laparoscopic repair of the perforation. The perforation is sutured laparoscopically using 4-0 PDS interrupted sutures



Figure 4: Postoperative upper gastrointestinal study. Complete closure of stomach perforation is confirmed, with no leakage apparent

the gastric wall, and that laparoscopic repair can be safely performed even in situations of emergency surgery.

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### Conflicts of interest

There are no conflicts of interest.

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