

A Case Report of a Rare Presentation of Meckel's Diverticulum and Complex Abdominal Wall Repair

Y Hamad¹, I Abdallah², G Colucci¹

¹Worthing hospital, UK

²East Surrey hospital, UK

Abstract:- Contaminated abdominal wall defects are always a challenge to repair. Several techniques are described in the literature to variable outcomes. We report a complicated case of abdominal wall abscess secondary to perforated Meckel's diverticulum in an obese lady with a recurrent large ventral hernia. Such a case was not previously reported in the literature. Abdominal wall repair was performed using a biosynthetic (STRATTICE™, Allergan) mesh bridge and negative pressure wound therapy.

I. INTRODUCTION

The repair of contaminated abdominal wall defects remains a challenge to most surgeons. It is often associated with a high rate of complications and failure. Several techniques have been developed over the years using anatomical repair techniques and different types of mesh materials.

In most cases, skin closure is achieved with ease, although sometimes that might also become challenging due to significant tissue loss. We describe a complex case of a perforated Meckel's diverticulum (MD) into the abdominal wall in an obese lady with a recurrent large ventral hernia. A similar case was not previously reported in the literature. A single case of abdominal wall abscess secondary to MD in a young female was reported by Karatepe et al. (1). In our case, abdominal wall repair was successfully achieved using a biosynthetic (Strattice) mesh bridge and negative pressure wound therapy (NPWT).

II. CASE REPORT

This is a case of 42 years old lady who presented with abdominal pain, erythema, and discharge around the umbilicus for two days. She was morbidly obese with a BMI of 64.5, and had a background of a recurrent long-standing sizeable ventral hernia, asthma, bipolar disorder, and hip osteoarthritis. She was awaiting review for consideration of elective bariatric surgery. On examination she was in pain and appeared to have necrotic periumbilical skin with pus discharge and offensive odour. Initial blood tests showed markedly raised inflammatory markers. Computed Tomography scan of the abdomen and pelvis showed extensive inflammatory changes with subcutaneous oedema and a significant amount of subcutaneous gas suggestive of infection with gas-forming organisms in the right lower

abdomen surrounding the hernia sac, but confined in the subcutaneous tissues, with no evidence of intraabdominal free gas or fluid (Figure 1).

The patient underwent extensive abdominal wall debridement and washout and she was started on IV broad spectrum antibiotics. The patient was brought back to theatre for a planned second look after 72 hours. At this stage, there were apparent bowel contents in the wound. We decided to proceed to an exploratory laparotomy. We found Meckel's diverticulum fistulating into the previous Polypropylene mesh and into the abdominal wall. There was no evidence of intraabdominal contamination. A Meckel's diverticulectomy was performed using a stapling device. An extensive debridement of the abdominal wall with complete excision of the synthetic mesh was performed. Due to the local infection, it was decided to proceed with a temporary abdominal closure using an intra-abdominal negative pressure wound system (RENASYS-F/AB Abdominal Dressing Kit). Postoperatively, the patient was taken to the Intensive care unit.

After 48 hours, the patient was returned to theatre. The wound appeared clean, with no sign of ongoing infection. There was minimal swelling of the soft tissue. Due to the size of the hernia defect, the loss of soft tissue and the habitus of the patient, a primary closure were deemed not feasible even using a component separation technique. We then performed a bridged repair using a biological mesh (STRATTICE™, Allergan). The mesh was parachuted to the anterior rectus sheath (Figure 2) using 1 PDS interrupted stitches, leaving at least 3 cm of overlapping mesh under the rectus sheath. The skin closure was not possible due to the extensive loss of tissue soft tissue. A negative pressure wound therapy system (NPWT) (RENASY Negative Pressure Wound Therapy System) using an antimicrobial dressing (AMD™, Kerlix™ roll) was used. The patient had regular dressing change in the wards. The antibiotics were stopped on day 12 post op and the patient was discharged home after four weeks with the the NPWT system in place. The wound was managed in the community with regular fortnight review in hospital by the tissue viability nurse. After two month, the NWTW system was swapped PICO Single Use Negative Pressure Wound Therapy System-Smith and Nephew. At 4 month, the wound was almost completely epithelialized (Figure 4). The histology report confirmed MD with no ectopic or neoplastic tissue.

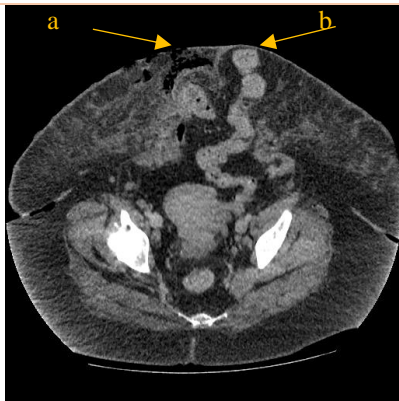


Figure 1: Preoperative CT abdomen and pelvis shows extensive inflammatory changes and subcutaneous gas (a) adjacent to the recurrent abdominal wall hernia (b).



Figure 2: Mesh bridge intraoperatively. Strattice mesh was fixed to the edges of the fascia.



Figure 3: Wound healing after two months.

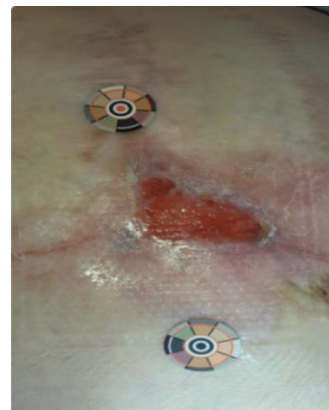


Figure 4: Wound nearly healed after four months.

III. DISCUSSION

MD results from failure of obliteration of the Vitello-intestinal duct(2,3). It may present with complications in the paediatric age group or persist to adulthood. The risk of complications from MD ranges between 4-40%(2). MD is often diagnosed incidentally during gastrointestinal imaging or surgery for unrelated problems. The diagnosis of perforated MD is made intraoperatively in most cases due to its similar presentation to other more common pathologies like perforated appendicitis. MD rarely causes the formation of enterocutaneous fistulation and, in extreme cases, may present as abdominal wall abscess, as shown in this case report. The diagnosis in these cases is quite challenging, especially when the patient is obese and has a large ventral hernia. Computed tomography is always indicated to assess for evidence of necrotising fasciitis and intraperitoneal perforation.

Management of large infected abdominal wall defects is a challenge for most surgeons. The use of biological mesh has been preferred in contaminated defects since it's emerged. However, some studies have shown no significant

benefit in comparison to the use of synthetic mesh(4). In our case, primary fascial closure was not possible due to the large hernia and the necrotic tissue debridement and mesh removal, which has led to significant tissue loss. Closure was postponed for a period of 48 hours to allow the edges to become more viable and to reduce the contamination. We adopted a biosynthetic mesh (STRATTICE™) bridge and NPWT, which showed excellent results. STRATTICE™ mesh is a non-cross-linked porcine dermal matrix that enhances the rapid growth of cells, collagen and blood vessels. Similar successful use of biosynthetic mesh bridge was reported in the Literature(5–7). Patel et al.(8) showed that the use of Strattice mesh in complex abdominal repair showed less rate of complications and mesh removal than other types of meshes. There's no enough data on the success rates of Strattice mesh in this type of abdominal wall closure particularly.

REFERENCES

- [1]. Karatepe O, Adas G, Altioek M, Ozcan D, Kamali S, Karahan S. Meckel's diverticulum manifested by a subcutaneous abscess. *World Journal of Gastroenterology*. 2009 Dec 28;15(48):6123–5.
- [2]. Choi SY, Hong SS, Park HJ, Lee HK, Shin HC, Choi GC. The many faces of Meckel's diverticulum and its complications. *Journal of Medical Imaging and Radiation Oncology*. 2017 Apr 1;61(2):225–31.
- [3]. Sagar J, Kumar V, Shah DK. Meckel's diverticulum: a systematic review. Vol. 99, *J R Soc Med*. 2006.
- [4]. Atema JJ, de Vries FEE, Boormeester MA. Systematic review and meta-analysis of the repair of potentially contaminated and contaminated abdominal wall defects. Vol. 212, *American Journal of Surgery*. Elsevier Inc.; 2016. p. 982-995.e1.
- [5]. Gentile P, Colicchia GM, Nicoli F, Cervelli G, Curcio CB, Brinci L, et al. Complex abdominal wall repair using a porcine dermal matrix. *Surgical Innovation*. 2013 Dec;20(6).
- [6]. Cavallaro A, Menzo E lo, di Vita M, Zanghì A, Cavallaro V, Veroux PF, et al. Use of biological meshes for abdominal wall reconstruction in highly contaminated fields. *World Journal of Gastroenterology*. 2010 Apr 21;16(15):1928–33.
- [7]. Velmahos GC, Demetriades D, Mahoney E, Burke P, Davis K, Larentzakis A, et al. The worst-case scenario: Bridging repair with a biologic mesh in high-risk patients with very large abdominal wall hernias—a prospective multicenter study. *Surgery (United States)*. 2020;
- [8]. Patel KM, Albino FP, Nahabedian MY, Bhanot P. Critical analysis of Strattice performance in complex abdominal wall reconstruction: Intermediate-risk patients and early complications. *International Surgery*. 2013;98(4):379–84.