CASE REPORT – OPEN ACCESS

International Journal of Surgery Case Reports 30 (2017) 126–129

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Incarcerated and eventrated abdominal wall hernia reconstruction with autologous double-layer dermal graft in the field of purulent peritonitis—A case report

Gábor Martis*, Máté Rózsahegyi, János Deák, László Damjanovich

University of Debrecen, Clinical and Health Science Center, Department of Surgery, Debrecen, 4032, Móricz Zsigmond út 22, Hungary

ARTICLE INFO

Article history:
Received 2 September 2016
Received in revised form 2 December 2016
Accepted 4 December 2016
Available online 6 December 2016

Keywords:
Double-layer dermal graft
Incarcerated hernia
Eventrated hernia
Dirty wound
Low tension reconstruction
Case report

ABSTRACT

INTRODUCTION: Double-layer dermal grafts are used for the management of complicated abdominal wall hernias in obese, high risk patients. The method has not yet been used in case of emergency in septic/dirty environment.

CASE REPORT: A 76-year old female patient (BMI 36.7 kg/m^2) was admitted with mechanical bowel obstruction and sepsis caused by a third time recurred, incarcerated and eventrated abdominal wall hernia. During the emergency surgery perforation of the terminal ileum and the ascending colon was detected, along with a feculent peritonitis and extended abdominal wall necrosis. Extended right hemicolectomy and necrectomy of the abdominal wall were performed. The surgery resulted in an abdominal wall defect measuring 223 cm^2, for the management of which direct closure was not possible. Using a specific method, an autologous dermal graft was prepared from the redundant skin. The first dermal graft was placed under the abdominal wall with 5 cm overlap, and the second layer was placed onto the first layer with 3 cm overlap in a perforated fashion. The operating time was 250 min. No significant intra-abdominal pressure elevation was measured. No reoperation was performed. On the fifth postoperative day, the patient was mobilised. She was discharged in satisfactory general condition on the 18th postoperative day. There is no recurrent hernia 8 months after the surgery.

DISCUSSION: Abdominal wall reconstruction was possible in a necrotic, purulent environment by using a de-epithelised autologous double layer dermal graft, without synthetic or biological graft implantation. The advantage of the procedure was cost-effectivity, and the disadvantage was that only in an obese patient is the sufficient quantity of dermal graft available.

CONCLUSION: A homogeneous internal and perforated outer dermal graft was suitable for bridging the abdominal gap in the case of an obese, high risk patient. Autologous dermal grafts can be a safe and feasible alternative to biological meshes in emergency abdominal wall surgeries. Evaluation of a case series can be the next cornerstone of the method described above.

1. Introduction

Closing the abdominal wall safely and in a tension-free manner is a major challenge in the case of large, incarcerated abdominal wall incisional hernias [1–3]. In a septic, dirty environment (CDCP IV) reconstruction of a large defect by direct sutures is impossible. In these cases, the use of the acellular dermal matrix (ADM) is an obvious option to close the large abdominal gap, however biological grafts are not generally available. One of the disadvantages of biological grafts is their app. 11–36% recurrence and 8–15% surgical site infection rate [4]. Implantation of synthetic grafts in a septic field is technically possible, however a significantly higher complication rate is to be expected [5]. The autologous single or double-layer dermal grafts in the case of obese, high risk patients with recurrent, infected hernias can be successfully used in elective abdominal wall reconstructions [6,7]. We present a case report in which double-layer dermal grafts were applied for the reconstruction of a recurrent, eventrated and incarcerated abdominal wall hernia in a dirty operating environment performed in an academic institution. This case report has been written in full accordance with the SCARE criteria [8].

2. Case report

2.1. Patient's clinical data and surgical method

The medical history of the 76-year-old female patient includes hypertension treated for 30 years, type II diabetes mellitus treated for 24 years, coronary heart disease, myocardial infarction suffered 15 years earlier, senile dementia, open cholecystectomy performed

* Corresponding author.
E-mail address: gabor6911@gmail.com (G. Martis).

http://dx.doi.org/10.1016/j.ijscr.2016.12.002

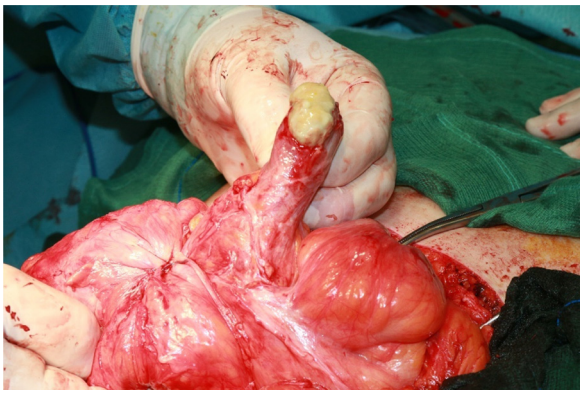

Fig. 1. Eventrated and incarcerated abdominal wall hernia. The perforated terminal ileum segment and the perforated hernia sac are visible in the left hand of the surgeon. The ascending and transverse colon as well as a remarkable segment of the terminal ileum were incarcerated and perforated into the hernia sac.

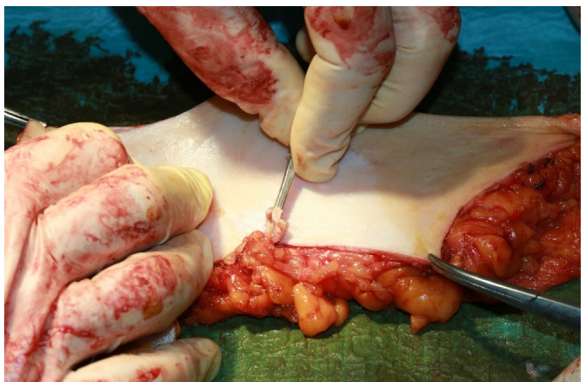

Fig. 2. Adequate preparation of the epidermal surface of dermal graft. The epidermis was removed by scalpel. The colour difference between the removed and not yet removed epidermal surface areas (light brown coloured area: removed epidermis, darker yellowish-brown coloured area: not removed epidermis) is clearly visible.

35 years earlier and abdominal wall hernia repairs (altogether on five occasions, three of them were performed due to incarceration). The patient had morbid obesity, the body mass index (BMI) was 37.8 kg/m^2. There was no regular alcohol consumption and smoking in her medical history. Five days prior to her admission a progressive abdominal pain set in. She was brought by ambulance in weak general condition and in status febrilis. After physical examination, the primary admission diagnosis was septico-toxic shock, and acute abdomen caused by recurrent, incarcerated and eventrated abdominal wall hernia. On admission, an eventrated hernia of the size of a handball and local defense musculaire were palpable in the right subcostal region. Following abdominal ultrasonography, laboratory tests, chest X-ray, native abdominal X-ray, securing central venous access, epidural cannulation and intravesical catheter insertion, an urgent right upper transverse laparotomy was carried out. The surgeon performing the procedure was an expert in different types of abdominal wall reconstructive surgeries. The operation was carried out under general anaesthesia and complete muscle relaxation. Local feculent peritonitis was found in the eventrated hernia sac along with considerable subcutaneous inflammatory oedema. The peritonitis was caused by the incarcerated and perforated ascending colon and terminal ileum (Fig. 1). During surgery extended right hemicolectomy and resection of app. 60 cm segment of the terminal ileum were performed with side-to-side ileo-transversostomy. After necrectomy, a 223 cm^2 abdominal gap (app. 14 × 16 cm) remained on the abdominal wall. Closing the defect by direct sutures was not possible. A biological graft was unavailable. Synthetic mesh implantation was not considered with respect to the CDCP IV environment. The wide, bay leaf shaped dermal-subcutaneous pannicule removed at the initiation of the surgery was used for the abdominal wall reconstruction. First the epidermis (Fig. 2) then the subcutaneous adipose tissue was removed from the pannicule (Fig. 3). The defect was completed with the prepared dermal flaps. The first homogeneous dermal graft was cut to size and was inserted into the abdominal cavity with its epidermal surface facing out, and it extended over the edge of the defect by at least 5 cm. The dermal graft was fixed to the abdominal wall by interrupted, 2/0 non-absorbable stitches (Fig. 4). The external dermal graft was fixed with the original epidermal surface facing the abdominal cavity with at least 3 cm overlap using 2/0 non-absorbable stitches. The external dermal graft was perforated as it is seen in Fig. 5. The greater omentum was carefully spared. Direct abdominal sutures were not applied. The

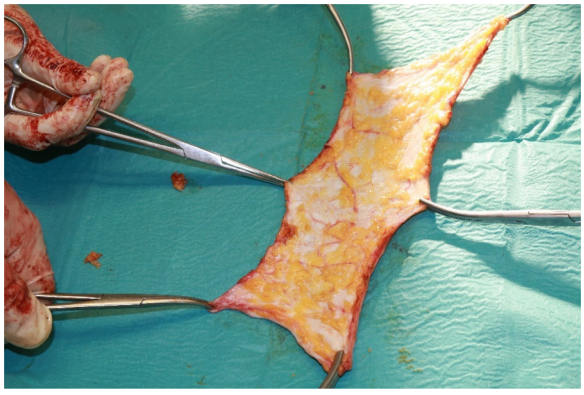

Fig. 3. Adequately removed subcutis. It is clearly visible that a small amount of fat tissue remained on the dermis. The abundant adipose derived stem cells (ADSC), located in the fat tissue. ADSC play an important part in the integration and remodelling of the grafts.

Table 1
Changes of intraabdominal pressure and body temperature, as well as the results of the laboratory tests between the 1–17th p.op. days.

	Postoperative day					
	1	2	3	4	5	17
Intra-abdominal pressure (mmHg)	13	13	10	9	7	8
C reactive protein (mg/L)	316	252	275	268	208	95
Glucose (mmol/L)	22,6	16,5	14,3	8,5	8,1	7,9
Creatinine (μmol/L)	115	143	153	101	75	64
Creatine kinase (IU/L)	5124	2844	1340	2413	1520	176
GFR (mL/min/1,73m^2)	44	48	40	28	64	81
Na (mmol/L)	138	140	138	152	152	143
K (mmol/L	4,8	4,3	4	4,6	4,3	4
Temperature (°C)	38,7	39,1	38,2	37,6	36,9	36,7
Hemoglobin (g/L)	85	84	92	98	105	112

Abbreviations: GFR: glomerule filtration rate, Na: sodium, K: potassium.