CASE REPORT – OPEN ACCESS

International Journal of Surgery Case Reports 33 (2017) 167–172

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Abdominal wall reconstruction after desmoid type fibromatosis radical resection: Case series from a single institution and review of the literature.

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ARTICLE INFO

Article history:
Received 18 November 2016
Received in revised form 26 February 2017
Accepted 27 February 2017
Available online 1 March 2017

Keywords:
Case series
Abdominal wall reconstruction
Desmoid type fibromatosis
Desmoid resection
Surgical technique

ABSTRACT

BACKGROUND: Abdominal wall desmoid type fibromatosis management has been changing over recent years, from an aggressive approach towards a more conservative one. When radical resection is indicated, the surgical team faces the challenge of abdominal wall reconstruction, for which optimal technique is still debated. The present study reports the experience from a single center with abdominal closures after desmoid type fibromatosis resection.
MATERIAL AND METHODS: Retrospective analysis of patients who underwent abdominal wall closure after sporadic abdominal desmoid type fibromatosis radical resection from 1982 to 2013.
RESULTS: Twenty-seven patients were included, mean tumor diameter was 10 + 5.3 cm, and the main choice of abdominal wall reconstruction was midline closure with anterior rectus sheath relaxing incisions and polypropylene onlay mesh (74% of the cases). Only 7% of the cases required more complex procedures for skin closure. Mean follow-up was 5 years and 89% remained disease-free. No grade 4 or 5 complications were observed.
CONCLUSION: High midline fascial closure rate can be achieved after resection of abdominal wall desmoid tumor using relaxing incisions and mesh, with low complication rate.

1. Introduction

Desmoid tumors, desmoid type fibromatosis or aggressive fibromatosis are designations of a benign mesenchymal neoplasm with monoclonal proliferation, which belongs to a family of myofibroblastic fibromatosis characterized by aggressive local infiltration of surrounding tissues, with uncertain growth and increased chances of recurrence, despite no metastatic potential [1]. Although first described by MacFarlane in 1832 [2], the designation desmoid was given in 1838 by Muller in Berlin, who first used the term "desmos" relating to the Greek word – which means "similar to tendon" [3].

Such neoplasia is extremely rare, corresponding to 3% of soft-tissue tumors. Incidence is estimated in 2–4 per million population, with 900 new cases per year in the US. Some 70% of patients diagnosed with desmoid type fibromatosis have tumors related to Familial Adenomatous Polyposis (FAP), including a mutation in the APC gene [4]. In most of the patients with sporadic desmoid type fibromatosis (which are not related to FAP), the tumorigenesis is related to endocrine and physiologic factors, including estrogen hormonal stimulus and pregnancy [5–7]. In those cases, up to 25% of the patients have previous history of trauma or surgical incisions, which are related to the topography of these tumors [1,8–10].

Management changed dramatically in the past decade. Surgery was the first line of treatment, consisting of radical therapy with wide resection of the tumor and adjoining tissues. Despite that aggressive approach, recurrence rates stood between 10% and 40%. More recently, additional treatments such as radiotherapy, chemotherapy, hormonal inhibitors and non-hormonal anti-inflammatories have been used as complement or even as the first approach [11–18]. Whenever radical resection is indicated, the abdominal wall defect closure remains an important challenge to the surgical team and there is no defined consensus regarding the best choice of abdominal wall reconstruction.

Therefore, the aim of this study is to analyze the experience in abdominal wall reconstruction as a result of sporadic desmoid type fibromatosis resection at a single center in São Paulo, Brazil, specifically focusing on the surgical technique.

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http://dx.doi.org/10.1016/j.ijscr.2017.02.050

Table 1
Demographic Characteristics of 27 Patients who underwent Abdominal Wall Desmoid Type Fibromatosis Resection.

Gender	
Female	24 (89%)
Male	3 (11%)
Age at diagnosis (mean ± SD)	34 ± 15 years
Resected specimens	
Size (mean ± SD)	10 ± 5,3 cm
Weight (mean ± SD)	558 ± 501 g
Pregnancy	
Past history	22 (81%)
Diagnosed during pregnancy	3 (11%)
Tumor at previous incision	18%

2. Material and methods

This case series was conducted based on a comprehensive retrospective analysis of charts from patients submitted to radical therapy of abdominal wall desmoid type fibromatosis treated between 1982 and 2013 in the General Surgery Service in the Division of Surgical Clinic III of the Hospital das Clínicas of the University of Sao Paulo, School of Medicine. Local ethical committee approved the study and the research registry number is 1853.

All patients had preoperative abdominal CT scan or magnetic resonance for surgical planning, and underwent operative procedure in a supine position with urinary catheterization and prophylactic antibiotics. The surgery comprised radical resection, with three centimeters free surgical margins, intraoperative frozen section of margins, and further resection in case of residual neoplasm. Despite the period of this cohort, all surgeons involved in the study belonged to Sarcoma and Melanoma Group of the General Surgery Service of Hospital das Clínicas – University of São Paulo. Indications were previously discussed at multidisciplinary meetings. Wide resection was achieved in all procedures, comprising the tumor, all layers of the abdominal wall and healthy adjacent tissues. Even though the period studied was long, the surgical procedure remained the same. All patients were followed in the outpatient clinic after discharge.

3. Results

Twenty-seven patients were included in the study. Table 1 summarizes demographic data of the cohort. From the three patients diagnosed during their pregnancies, one was able to start treatment six months after the beginning of gestation, and another had to undergo surgery while in her 16th week of pregnancy, because the tumor's mass effect was compromising the development of the fetus (Figs. 1–3). The third patient underwent tumor resection during her C-section.

Seven patients had undergone previous abdominal procedures and 18% of those had tumors arising within surgical scars, in line with the desmoid type fibromatosis pathophysiology. Tumor weight varied from 15 to 2.125 g, and tumor diameter from 2 to 25 cm. (Fig. 4).

3.1. Surgical technique

Resection encompassed removal of the neoplasm, subcutaneous tissue, muscles, peritoneum and, in more superficial lesions, skin parts. After radical resection, the abdominal wall defect was addressed, and surgeons faced two reconstruction scenarios, summarized in Fig. 5. First, and more frequent, were abdominal wall defects that allowed primary closure. In this scenario, the use of relaxing Gibsonís incisions granted successful approach of the wound edges with no tension, followed by a midline fascial closure using polyglactin continuous suture (Fig. 6). In this group, onlay polypropylene mesh placement was frequent. This technique was used in 22 of 27 patients (81,5%).

Fig. 1. Magnetic Resonance in a pregnant woman revealing abdominal wall desmoid tumor.

Fig. 2. Preoperative planning of skin resection.

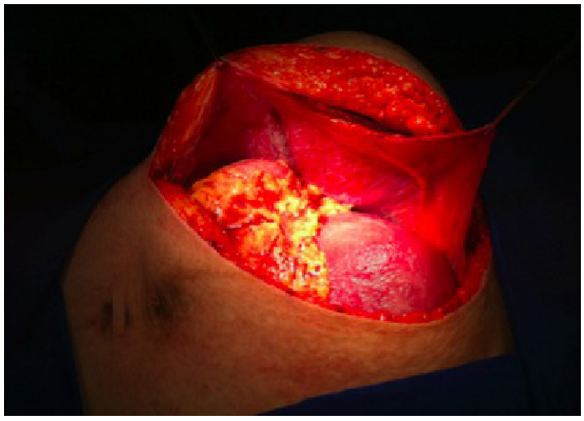

Fig. 3. Surgical incision showing pregnant uterus. The peritoneal surface protects bowel loops from polypropylene mesh repair.