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## Abdominoplasty and thoraco-epigastric flaps for large anterior trunk defects after *dermatofibrosarcoma protuberans* wide resection: Two illustrative cases

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## ABSTRACT

**INTRODUCTION:** Excision of large *dermatofibrosarcoma protuberans* in the anterior aspect of the trunk often results in large surgical defects that frequently dictate the need for microsurgical reconstruction. However, this option is not always available.

**PRESENTATION OF CASE:** The authors describe two patients with very large anterior trunk *dermatofibrosarcoma protuberans*: one in the epigastric region and the other in the hypogastric region. In the patient with the hypogastric tumor, a classical abdominoplasty flap associated with umbilical transposition was used to cover the skin defect after muscle and fascial plication, and placement of a polypropylene mesh. In the patient with the epigastric tumor, a synthetic mesh was also placed, and the skin and subcutaneous defect was reconstructed with a reverse abdominoplasty flap and two thoraco-epigastric flaps. In both cases, complete closure was possible without immediate or late complications.

**DISCUSSION:** The local options described in this paper present several potential advantages compared to microsurgical reconstruction, namely they are easier and faster to perform and teach; they provide a good skin color and texture match; they are not associated with distant donor site morbidity; follow-up is usually less cumbersome; the post-operative hospital stay tends to be shorter; they are less costly; they are less prone to complete failure.

**CONCLUSION:** The authors believe that these two patients clearly show that local flaps, although frequently neglected, continue to be valid options for reconstructing large anterior trunk defects, even in the current era of microsurgery enthusiasm.

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### 1. Introduction

*Dermatofibrosarcoma protuberans* (DP) is a low-grade sarcoma, derived from fibroblasts, with an estimated incidence rate of 0.8 cases per million each year.<sup>1,2</sup> It is characterized by its local aggressiveness and relatively high recurrence rates.<sup>2–5</sup> Classically, wide excisional surgery with at least 3 cm of free tissue margins was recommended as the treatment of choice.<sup>6</sup> Some authors have even advocated wider excision margins, setting the 5 cm excision margin as the safest.<sup>7</sup> Most authors include in the resection specimen the superficial muscular fascia underlying the tumor.<sup>7</sup> Recently, several authors have been using Mohs surgery with a very low recurrence rate (1%), achieved with relatively narrow excision margins, and allowing primary closure in most patients.<sup>8,9</sup> Mohs' surgery consists of sequentially excising the tumor, in sections, starting superficially and subsequently including the deep aspect of the tumor, with each section examined microscopically

for tumor margins.<sup>6,10</sup> However, presently, this technique is not always readily available. In addition, it is still not possible, even with Mohs surgery, to completely exclude the need for large excisions that, in turn, mandate complex reconstructions.<sup>7,11–13</sup>

DP most frequently arises on the trunk.<sup>2</sup> Large surgical defects after excision of DP in the anterior aspect of the trunk often dictate the need for microsurgical reconstruction.<sup>6,7,14</sup> However, this is not always available, due to lack of surgical expertise in that field, absence of postoperative care resources or due to the relatively high costs associated.<sup>15</sup> Therefore, local reconstructive options can still be ideal in several circumstances, although they are frequently neglected in the literature.

In this paper, two illustrative cases of wide excisions of DP in the anterior trunk, subsequently reconstructed with local options are presented.

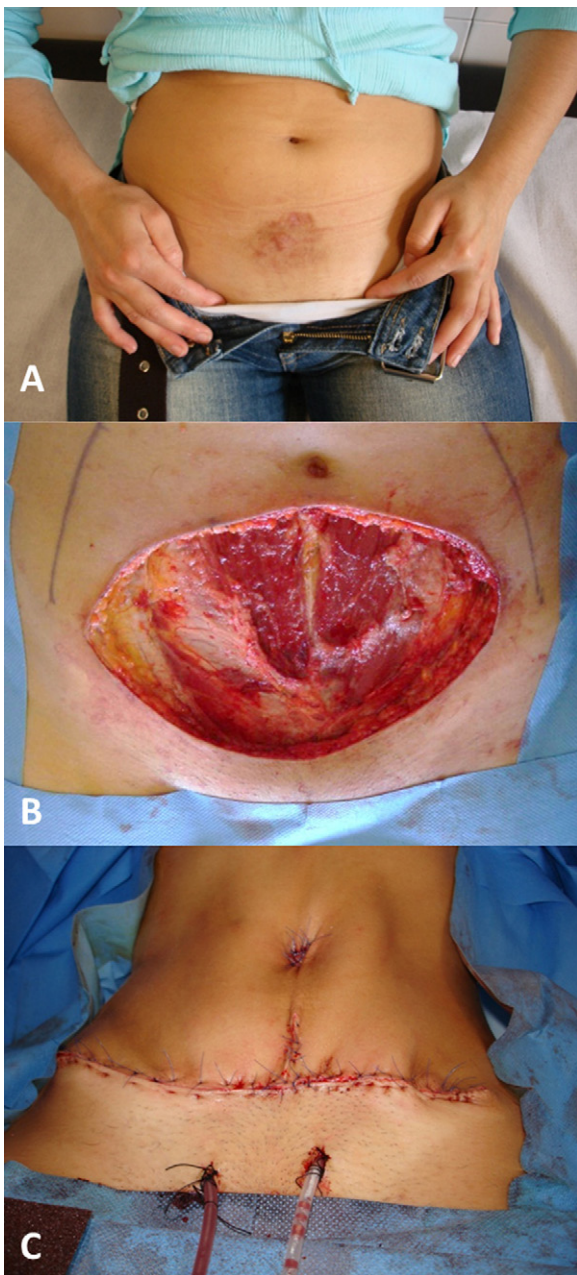
### 2. Presentation of cases

#### 2.1. Case 1

A 32-year-old female, with no significant prior medical history, presented with a 10-cm-wide and a 8-cm-long mass in the hypogastric region that had been growing insidiously for the

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**Fig. 1.** (A) A 32-year-old female presented with an hypogastric nodular mass that was identified as a *dermatofibrosarcoma protuberans* by incisional biopsy. (B) Intraoperative of the defect after resection of the tumor with a 5 cm margin including the underlying anterior rectus sheath and the external oblique muscle. (C) Immediate postoperative view, after closure of the defect with a classical abdominoplasty flap and umbilicus transposition. A vertical incision had to be made in the abdominoplasty flap.

previous two years (Fig. 1A). An incisional biopsy established the diagnosis of DP. A MRI of the region suggested that the tumor was close to the underlying muscle fasciae. Prior to surgery, with the patient in the semi-Fowler's position, the pinch test in the lower abdomen suggested that the classical abdominoplasty flap could probably be advanced 18 cm, that is to say the length of the of the tumor (8 cm) plus an upper and lower 5 cm margin, without undue tension.<sup>16</sup> However, the possibility of having to resort to pedicled thigh flaps, such as the tensor fascia lata flap, was entertained and explained to the patient.

A 5-cm-wide resection was performed, including the anterior sheath of the rectus abdominis muscle and part of this muscle, as

well as part of the external oblique muscle (Fig. 1B). The fascial defect was obliterated with a polypropylene mesh. To decrease the surface of the exposed muscles and fasciae, median and paramedian plication in the remaining exposed fasciae were performed. Skin and subcutaneous tissue closure was achieved through the raising and advancement of a classical abdominoplasty flap (30 cm wide and 20 cm long) with umbilicus transposition. The incision around the umbilicus failed to reach the pubic flap. Therefore, a sagittal incision in the abdominoplasty flap had to be made (Fig. 1C). The postoperative period was uneventful. Histopathology examination confirmed complete resection of the DP. Five years postoperatively, no recurrence was detected. The patient had no functional limitations, bulging or hernias (Fig. 2). The esthetical result was judged satisfactory both by the patient and the surgical team.

## 2.2. Case 2

A 50-year-old homeless man presented with a large ulcerated mass in the epigastric region that had been growing progressively for the previous 3 years (Fig. 3). The tumor was approximately circular with 18 cm in diameter. The patient was a heavy smoker (2 packs/day). His medical history was otherwise unremarkable. An incisional biopsy of the lesion revealed a DP. MRI showed closed proximity between the deep aspect of the tumor and the underlying muscles, particularly the pectoralis major muscle and the anterior portion of the rectus abdominis muscle sheath. Before surgery, the pinch test suggested that the reversed abdominoplasty flap could probably be advanced upwards 18 cm, the upper thoracic flap could be moved inferiorly around 8 cm, and that each thoraco-epigastric flap could be advanced cranially and medially approximately 14 cm (after the advancement of the reversed abdominoplasty flap). Hence, even with a 5 cm resection margin, it was anticipated that the integumentary defect resulting from the excision of the 18 cm wide tumor could be closed primarily without placing too much tension on the surgical wounds. Notwithstanding, it was explained to the patient that a free flap may prove to be necessary, being the anterolateral fasciocutaneous thigh flap or the latissimus dorsi myocutaneous flap the preferred options in this setting.<sup>14,17</sup>

A 5-cm-wide resection was performed including the underlying muscles and fasciae (Fig. 3). The fascial defect was closed with a polypropylene mesh. The skin and subcutaneous tissue defect was closed with a bilateral thoraco-epigastric skin flap (each with 20 cm in length and 18 cm in width), and a reversed abdominoplasty flap (33 cm wide and 15 cm long) without umbilicus transposition (Fig. 4). The postoperative period was uneventful.

Histopathology confirmed complete resection of the tumor. Three years postoperatively, no recurrence of the neoplasm was noted (Fig. 5). The patient showed no functional limitations, nor evidence of bulging or hernias. The esthetic result was considered satisfactory.

## 3. Discussion

Good oncological, functional and esthetical results were obtained in these two patients with local flaps, even though in both cases the tumors were larger than the average DP one is faced with in the daily practice. Obviously, other more elaborate reconstructive options could be entertained in both cases. These would include regional pedicled flaps, namely the omentum flap or latissimus dorsi flap for the epigastric region and several thigh flaps for the hypogastric region.<sup>7,11,18–20</sup> In addition, a myriad of distant free flaps raised from most regions of the body could be also considered.<sup>7,14,15</sup> In fact, it has been abundantly demonstrated that in large and complex defects of the anterior aspect of the trunk,

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