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Abdominal wall desmoid tumors: A proposal for US-guided resection



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ABSTRACT

BACKGROUND: Desmoid tumors (DTs) is a benign tumor with high tendency to infiltrative evolution and recurrence. Nowadays, in abdominal localization, the standard approach is surgery with R0 condition. The need to repair post-surgical wide wall defect requires conservative technique to decrease the incidence of incisional hernia and to obtain better quality of life (QoL).

METHODS: We perform an abdominal wall desmoid resection using ultrasound guide. This technique ensures to spare a wide wall area and to obtain a multilayer reconstruction minimizing postoperative risk. This approach allows good oncological results and better managing abdominal wall post-resection defect.

RESULTS: We use US guided surgery to get radical approach and wall tissue spare that allows us a multilayer reconstruction minimizing post-operative complications. No recurrences were observed in one year follow up period.

CONCLUSION: Our experience represents first step to consider ultrasound mediated technique useful to optimize wall resection surgery and to minimize following complications.

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1. Introduction

DTs, also known as aggressive fibromatoses, are benign myofibroblastic neoplasms originating from muscular aponeuroses that are also classified as deep fibromatoses [1]. They constitute 3% of all soft tissue tumors and 0.03% of all neoplasms [2]. Despite their aggressive local infiltration, DTs lack metastatic potential [3]. However, the local infiltrations and compressions of surrounding structures demonstrate a high recurrence rate, and in specific anatomic localizations with restricted access to surgical resection (i.e., extra-abdominal tumor invading nerves ad vases), may lead to fatalities [4]. The appearance of DTs depends on the relative amounts of fibroblast proliferation, fibrosis, collagen content, and vascularity of the tumor. At US they are masses of low, medium, on high echogenicity with smooth, sharply defined margins. The lateral borders may appear ill defined or irregular [5]. DTs usually occur in fertile females and are uncommon during the menopause; during pregnancy an increase in volume occasionally occurs in already existing tumors. This supports the estrogen-stimulated tumor growth hypothesis [6]. Numerous studies have demon-

strated that 37–50% of DTs are initiated in the abdominal area [7]. Abdominal DTs occur sporadically or are associated with certain familial syndromes, such as familial adenomatous polyposis (FAP) [8].

2. Case report

A 41-year-old female was admitted to the Department of General and Urgent Surgery of Santa Maria delle Croci Hospital, in Ravenna, Italy presenting an abdominal wall mass in the left anterolateral sector. During a physical examination, the mass was observed to be firm, lacking tenderness and fixed to the abdominal wall. The patient stated that the mass was in rapid dimensional growing in the last 4 months and painful in daily activities. The skin surrounding showed a scar sited cranially, mobile respect the wall mass as outcome of a previous surgical exploration in a primary hospital without subsequent resection. She was referred to our unit observation to precise adequate diagnosis and receive adequate cure. The patient had no familiar oncological past and no history of smoking, drinking alcohol or referred trauma. She took psychotropic medication. The analyzed blood parameters were within the normal range and the tumor markers were all negative. Pre-operative MRI scans revealed a nodular mass measuring 7.8 × 6 cm in diameter with quite regular edge and attenuation equal to the muscle. The mass originated from the cranial portion of the left rectus abdominis muscle and, following intravenous

Abbreviations: WIOUS, wall intraoperative US exploration; QoL, quality of life; US, ultrasound; DTs, desmoid tumors; FAP, familial adenomatous polyposis.

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Fig. 1. Desmoid in RMN preoperative study.

administration of contrast medium, demonstrated disomogeneous enhancement, being hyperintense in T2 compared to muscle tissue (Fig. 1). Because of the symptomatic setting, the tumor resectability and the gradual dimensional impairment, the patient was inserted in an operative program with a previous US exploration performed to check any dimensional variation and at the meantime to try to carry on a “US guided resection”. Planning technical strategy we decided to use a non-cross-linked biological prosthesis, size 20×20 cm, to obtain an adequate marginal overlap circumferentially and a comfortable adaptability for possibility of a future pregnancy and for daily physical activities.

3. Technical findings

Surgical technique was based on preoperative US exploration with a convex high frequency (3.5–5.5 MHz) probe to define the lesion margins and depth before cutting and draw the incision plot to minimize its length having an adequate mass exposure at the same time (Fig. 2). We used a subcostal curve shaped incision, 1 cm caudally the lesion skin projection to obtain a wide surgical view preserving skin edge vascularization. Considering previous



Fig. 3. WIOUS exploration. We put the electric scalpel under the probe to detect the right point of dissection using the metal knife image on US.

US-description, we got deep fat tissue dissection till lesion upper margin. The following dissection was along wall plan in fat tissue upper the fascia preserving an oncological safe margin. Deep “wall intraoperative US exploration” (WIOUS) described circumferential margin underling the transition area between DT and surrounding free muscle tissue with a distance from the center of the lesion of 4 cm (x), which is the lesion radius (Figs. 3 and 4). Positioning the probe across the transition area and electric scalpel under it, we got a larger incision with 1 cm safe margin ($x + 1$), using the shadow of metal knife on US image to define the right point of safe dissection. This technique allows us to look through the wall thickness and to avoid useless tissue sacrifice all around the lesion. We can burn the fascia by turns taking away the probe and obtain a plot that describes the resection circle area with radius $r = (x + 1)$. Deeply, the dissection was till peritoneal plane because of desmoid infiltrated deeper layers without nevertheless visceral invasion (Fig. 5). Subsequent reconstruction was obtained using “Rives technique” by lateral muscle flaps mobilization according to “Ramirez component separation technique” [9]. Macroscopically, the tumor had a solid texture, had no confirmed capsule, and its margins was ill-defined. The definitive histological diagnosis was “Desmoid tumor with free skeletal muscle margins and negative ER-PR receptors”. The course was uneventful, and the patient was discharged on the seventh post-operative day. After a follow-up of 12 months after surgery, the patient is in good condition and complete remission, without



Fig. 2. Preoperative US exploration.

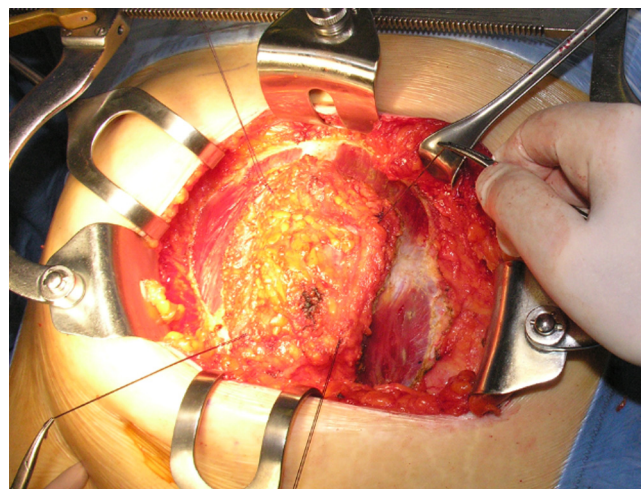


Fig. 4. Surgical US guided margins: lesion radius plus 1 cm (r).

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