

CASE REPORT / ПРИКАЗ БОЛЕСНИКА

Full-thickness chest wall reconstruction after resection of recurrent desmoid-type fibromatosis

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Introduction Desmoid-type fibromatosis (DF) is a benign but locally infiltrative soft tissue tumor that develops from fascia and musculoaponeurotic tissue with high local recurrence rate. The aim of this article was to present a case of recurrent DF of the chest wall and chest wall reconstruction after tumor resection.

Case outline A 62-year-old man came for an examination due to a tumor localized on the right anterior chest wall. The previous year, the patient had undergone surgical excision of DF of the abdominal wall. Physical examination found a firm and painless 6–7 cm mass on the right side of the chest wall with no swelling of superficial lymph nodes. A computed tomography scan revealed a homogenous mass of soft tissue density, measuring 7.12 × 4.23 cm, arising from right anterolateral wall of thoracic cage with adjoining ribs destruction. The patient was taken to surgery, and right thoracotomy was done with excision of tumor along with resection of the eighth, ninth and tenth rib. The results of pathological examination were consistent with the frozen section, and the patient was diagnosed with DF. Despite the absence of postoperative radiotherapy, there was no evidence of local recurrence two years later.

Conclusion Surgical treatment of recurrent DF of the chest wall requires a wide resection with negative margins. Multidisciplinary approach in case of full-thickness defect of the chest wall and combination of pedicled muscle flap and polypropylene mesh are important to provide chest wall stability.

Keywords: fibromatosis; chest wall resection; surgery

INTRODUCTION

Desmoid-type fibromatosis (DF) is a benign but locally infiltrative soft tissue tumor that develops from fascia and musculoaponeurotic tissue [1]. DF was first described in the abdominal wall and later in the extremities and chest wall with high incidence of local recurrence [1, 2]. Recurrent DF displayed a different biological behavior than primary disease and excision of recurrent DF is associated with high risk of further recurrence [2]. Treatment of recurrent DF with infiltration of ribs is challenging and requires a multidisciplinary approach [3].

We present a case of full-thickness chest wall reconstruction with a pedicled latissimus muscle flap (LD) and polypropylene mesh after the resection of recurrent DF.

CASE REPORT

A 62-year-old man presented with a two-months history of a right chest wall mass. The patient had undergone surgical excision of DF of the abdominal wall the previous year. Physical examination found a firm and painless 6–7 cm mass on the right side of the chest wall attached to the deep tissues with no swelling of superficial lymph nodes (Figure 1a). A computed

tomography scan revealed a homogenous mass of soft tissue density, measuring 7.12 × 4.23 cm, arising from the right anterolateral wall of the thoracic cage with adjoining ribs destruction (Figure 2). The patient was taken to surgery, and right thoracotomy was done. Wide resection with a tumor free margin (> 3 cm) along with the resection of adjacent muscles of chest and abdominal wall and the eighth, ninth, and tenth rib were performed (Figure 1b and 1c). The reinsertion of diaphragm and reconstruction of the abdominal wall with polypropylene mesh were performed as well (Figure 1d and 1e). The right LD was harvested and transposed through subcutaneous tunnel to the full-thickness chest wall defect (Figure 1f and 1g). Primary closure of wounds using four Redon drains was performed (Figure 1h). The patient was transferred to the intensive care unit and moved to general care after 24 hours. He was discharged from the hospital after eight days. The sutures were removed on day 14 after the surgery. The results of pathological examination were consistent with the frozen section, and the patient was diagnosed with DF. Despite the absence of postoperative radiotherapy, there was no evidence of local recurrence two years later (Figure 1i).

All procedures performed were in accordance with the ethical standards of the institutional and/or national research committee and

Received • Примљено:

April 21, 2024

Accepted • Прихваћено:

May 27, 2024

Online first: May 30, 2024**Correspondence to:**

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Figure 1. a – Patient presenting a desmoid-type fibromatosis on the right anterolateral chest wall; b – full-thickness defect after resection of desmoid-type fibromatosis; c – surgical specimen showing the tumor with adjacent ribs segment; d – reinsertion of diaphragm; e, f, g, and h – subsequent reconstruction of full-thickness chest wall defect and abdominal wall defect with polypropylene mesh and pedicled latissimus dorsi muscle flap; i – postoperative result after two years

with the Helsinki Declaration and its later amendments or comparable ethical standards. Written consent to publish all shown material was obtained from the patient.

DISCUSSION

Chest wall tumors have broad potential etiologies and surgery is considered a potentially curative treatment

[4]. Around 20% of DF are located in the chest wall. DF has a high local recurrence rate, and the goal of surgery is achieving negative margins without causing critical functional defects. The positive margins after resection are associated with high incidence of local recurrence [5, 6]. Aggressive and extensive resection are very important in successful management of DF. In the case when DF invade vital structures, obtaining negative margins often represents a therapeutic challenge for thoracic and

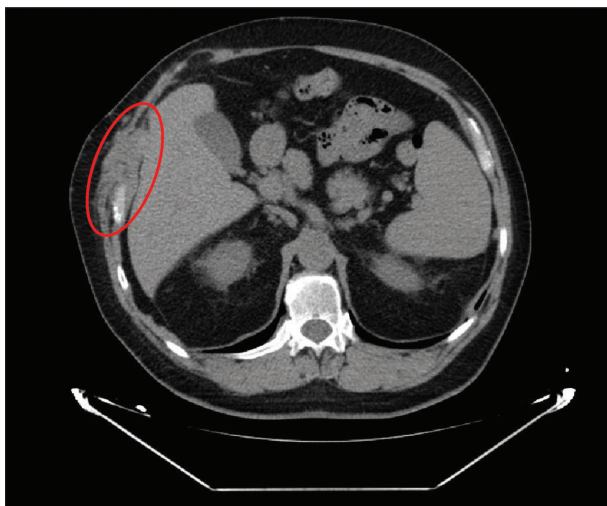


Figure 2. A computed tomography scan of the chest: tumor of the right anterolateral chest wall, dense tissue tumor arising from the anterolateral chest wall

reconstructive surgeons [4, 7]. Other treatment options for DF include radiation therapy, chemotherapy, antihormone agents, and tyrosine kinase inhibitors [1, 5]. Radiotherapy is recommended for patients with positive margins or unresectable tumor [8]. Treatment of recurrent DF of the chest wall remains a challenge due to infiltration of muscles and bone structure [1, 9].

In this case, we performed full-thickness anterolateral chest wall reconstruction with polypropylene mesh and LD after radical excision of DF. The DF invaded the eighth, ninth, and 10th rib with adjacent muscles. The full-thickness chest wall reconstruction must provide chest wall stability and avoid paradoxical motion [5, 10].

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The chest wall defects after resection of four or less consecutive ribs can be stabilized with Gore-Tex patch or polypropylene mesh with providing a good soft tissue cover for alloplastic materials [6, 7]. The alloplastic materials are to be used in chest wall reconstruction, but they carry the risk of infection. In case of infection, the alloplastic material must be removed [3, 8]. Wide range of the muscle or musculocutaneous flaps can be used to cover alloplastic materials and support chest wall stability such as LD, rectus abdominis flap, pectoralis major flap, omentum flap, or thoracoepigastric flap [11, 12]. The LD is a good choice for chest wall reconstruction in combination with ribs graft or alloplastic materials [12, 13]. The LD flap has minimal donor site morbidity without changes in the shoulder movement. The muscle flap's arch of rotation and effective length may be increased by dividing its humeral insertion. The disadvantages of harvesting the LD are visible donor scar and seroma formation [13].

The treatment of DF of the chest wall is very complicated and requires a multidisciplinary approach. A wide excision with clear resection margins of DF has lower risk of local recurrence. Full thickness defect of the chest wall after wide excision of tumor requires reconstruction with polypropylene mesh and local pedicled muscle or musculocutaneous flaps.

ACKNOWLEDGMENT

The authors acknowledge support of the Ministry of Science, Technological Development and Innovation of the Republic of Serbia, grant No. 451-03-66/2024-03/200110

Conflict of interest: None declared.

Реконструкција зида грудног коша после одстрањења дезмоидне фиброматозе

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САЖЕТАК

Увод Дезмоидна фиброматоза (ДФ) је бенигни али локално инфилтративни тумор меког ткива који настаје од фасције и мускулоапонеуротичног ткива, са високом стопом локалног рецидива.

Циљ овога рада био је да се прикаже случај рекурентне ДФ зида грудног коша и реконструкција зида грудног коша после одстрањења тумора.

Приказ болесника Приказан је мушкарац старости 62 године, који долази на преглед због туморске промене локализоване на десној страни предњег зида грудног коша. Болесник је подвргнут хируршкој ексцизији ДФ претходне године. Физикалним прегледом утврђена је чврста и безболна маса величине 6–7 cm са десне стране зида грудног коша без увећавања површинских лимфних чворова. Компјутеризована томографија је открила хомогену масу густине меког ткива,

димензија 7,12 × 4,23 cm, која полази из десног предњег спољашњег зида грудног коша са деструкцијом суседних ребара. Болесник је оперисан, урађена је десна торакотомија са одстрањивањем тумора и ресекцијом осмог, деветог и десетог ребра. Резултати патохистолошког прегледа су били у складу са *ex tempore* биопсијом, а болеснику је дијагностикована ДФ. Упркос одсуству радиотерапије, није било локалног рецидива после две године.

Закључак Хируршко лечење рекурентне ДФ зида грудног коша захтева широку ресекцију са негативним рубовима. Мултидисциплинарни приступ у случајевима дефеката пуне дебљине зида грудног коша и комбинација петељкастих мишићних режњева и полипропиленске мрежице важни су за обезбеђивање стабилности зида грудног коша.

Кључне речи: фиброматоза; ресекција зида грудног коша; хирургија