TRANPOSITION OF A REVERSE LATISSIMUS DORSI FLAP FOR A SUPRADIAPHRAGMATIC EMPYEMA

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SUMMARY:
The empyemas with supradiaphragmatic location are known as situations difficult to treat due to the dead angle located between the diaphragm and the lower face of the lung. Those situations require extensive rib resections for obliteration through classic thoracoplasties. We report a 49 years old male with an iatrogen pleuropneumothorax treated with tube thoracostomy and antibiotics, that led initially to a favourable evolution. After 4 months, he presents a suppurated cavity located between the diaphragm and the lower face of the lung. Access was gained through an initial muscle-sparing thoracotomy with mobilisation of the chest wall muscles, followed by a high section of the latissimus dorsi. The window of access was obtained through resection of 2 ribs. The cavity was filled with a reverse latissimus dorsi flap (inferior 2/3), vascularised by the perforant branches from the last intercostal and lumbar vessels. Postoperative course was favourable. The case is interesting because of the rare technique of the use of the latissimus dorsi, based on its secondary vascular pedicle.

Key words: empyemas, reverse latissimus dorsi flap.

REPARAȚIA UNUI EMPIEM SUPRADIAPRAFMCAT PRIN TRANSPOZIȚIE DE MUȘCHI MARE DORSAL REVERSAT

Rezumat
Empiemele localizate supradiaphragmatic sunt recunoscute ca dificil de tratat datorită unghiiului mort dintre diafragmă și fața inferioară a plămânului, ce impune rezeții costale extinse pentru desființarea lor prin toracoplastia clasică. Prezentăm un bolnav de 49 de ani cu un pio-pneumotorax iatrogen tratat prin pleurotomie minimă și tratament antibiotic, cu evoluție inițial favorabilă. La 4 luni de la pleurotomie se prezintă cu o cavitate supurată situată între diafragmă și baza plămânilui drept. Accesul s-a realizat inițial printr-o incizie posterolaterală tip muscle-sparing cu mobilizarea maselor musculare, urmată de seționarea înălță a marelui dorsal. După realizarea unei ferestre prin rezeția a 2 coaste și a spațiului intercostal aferent, cavitatea a fost umplută cu un lambou reversat de mare dorsal (2/3 inferioare), cu vascularizare asigurată de ramurile perforante din ultimele intercostale și vasele lombare. Evoluția postoperatorie favorabilă. Cazul este interesant prin raritatea acestui mod de folosire a marelui dorsal, bazată pe pedicul vascular secundar.

INTRODUCTION

Despite significant progress FROM the last decades, pleural empyema with remains a challenge for modern thoracic surgeons, significant morbidity and mortality. There are more options available, each of them with advantages and disadvantages (1). We report a patient with a supradiaphragmatic chronic empyema solved by transposition of a reverse latissimus dorsi flap,

CASE REPORT

We present a 49 years old male admitted to our unit with a right pleuropneumothorax with respiratory failure following thoracentesis for a parapneumonic empyema.

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performed in another unit (fig. 1-a,b). The initial treatment consisted in emergency tube-thoracostomy followed by antibiotic treatment and daily lavages. Postoperative course was difficult but eventually favourable with lung re-expansion and resolution of the pleural empyema (fig. 1-c,d), the patient being discharged at one month after the emergency tube-thoracostomy. Three months later he presented again with fever and chest pain. CXR (Chest X-Ray) and CT scan showed a supradiaphragmatic empyema with important pleural thickening but with no other parenchymal abnormality (fig. 2, 3). Due to persistant sepsis under antibiotic treatment and impossibility of effective removal of the pus through thoracenthesis we decided to perform surgery. Access was achieved through a postero-lateral skin incision, followed by mobilization of the latissimus dorsi and serratus anterior to allow access to the chest wall in order to identify of the cavity and to create a small window through limited resection of ribs 9 and 10. After a high division of the latissimus dorsi, the muscle was mobilised based on the secondary vascular pedicles and...
rolled inside the empyema cavity, which was completely obliterated (fig. 4). The skin and subcutaneous fat were closed with separate stitches. The procedure took 140 minutes, with 400 ml blood transfusion. Postoperative course was favourable, with immediate extubation, primary wound healing and discharge after 21 days (on postoperative day 21). A postoperative CT scan confirmed the viability of the flap and the complete obliteration of the cavity (fig. 5,6). The patient returned to normal active life with no recurrence or thoracic complaints at one year follow-up.

Fig. 3 - Preoperative CT-scan showing a supradiaphragmatic empyema with important pleural thickening

Fig. 4 - intraoperative images:
A: aspect of the cavity after its opening through a window created by limited resection of ribs 9 and 10; the serratus anterior was left intact.
B: Subtotal mobilisation of the reverse latissimus dorsi muscle flap.
C: Rolling of the muscle flap inside the empyema cavity.
D: Final aspect, with complete obliteration of the suppurated supradiaphragmatic cavity.
DISCUSSIONS

Space filling procedures are rarely used in the treatment of pleural empyema, usually where lung decortication (VATS or open) fails or is considered inappropriate (1, 2). Latissimus dorsi is used with great success because of its large volume, mobility and reliable primary vascular pedicle. When the flap is based on the thoraco-dorsal vessels it cannot reach the inferior part of the thorax, which is a significant limit for its use (3).

The reverse latissimus dorsi musculo-cutaneous flap has been used with success by plastic and neurosurgeons to cover lumbar and midline defects (4). Zambacos and Mandrekas (2007) report a case of a gluteal defect solved by the use of a reverse latissimus dorsi musculo-cutaneous flap (5). As a pure muscular flap, it has been used for diaphragm reconstruction following congenital defects (6) or after resection during extrapleural pneumonectomy (7). There are very few case-reports with its use for pleural empyema, mainly for closure of broncho-pleural fistula (8, 9).

The main disadvantages of the reverse latissimus dorsi flap are the variable anatomy of the small perforator branches arising from the last intercostals and lumbar vessels and the limited mobilization.

Due to the late presentation, our patient was not a good candidate for lung decortication, which carried a significant risk for developing a residual cavity with a larger volume. The supradiaphragmatic cavities are known as difficult to obliterate through classic thoracoplasties, requiring extensive rib resections. In our patient, use of the reverse latissimus dorsi flap allowed to avoid of an extended thoracoplasty or an open thoracic window which are both associated with an important chest wall mutilation and other late complications (10, 11, 12). Compared with a rectus abdominis or an omental flap, the reverse latissimus dorsi flap is associated with less donor-site morbidity.

Fig. 5 - CXR at 3 months after surgery.

Fig. 6 - Postoperative CT-scan showing complete obliteration of the cavity and viable muscle flap.
CONCLUSIONS

The latissimus dorsi muscle can be used also for empyema cavities located in the lower part of the thorax as a reverse flap based on its secondary blood supply.

The technique of mobilisation is very easy and can be performed by almost every thoracic surgeon. We believe that this kind of flap can be very useful in thoracic surgery and should be used more frequent.

REFERENCES

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