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“Omental flap for treatment of spondylitis with lumbosacral dehiscence: a case report”

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CASE REPORT

Contiguity spondylodiscitis associated with lumbosacral pressure sore is a rare condition. This chronic infection requires surgical debridement and spine stabilization. The surgical coverage of this spinal osteosynthesis material is essential to prevent infection. In some cases, it represents a surgical challenge due to the lack of locoregional options. We report a case of pedicled omental flap that was passed through the spine in order to cover a lumbosacral pressure sore while performing spine osteosynthesis. This clinical case is completed by a literature review of lumbar reconstruction cases with an omental flap in spine surgery.

A paraplegic (ASIA A) 43-year-old patient was admitted for an infected lumbosacral pressure sore. His medical history mentioned a vehicle accident 15 years ago with T4 vertebra level lesion. Over the last year, in a context of *Bacteroides fragilis* septicemia, a chronic spondylodiscitis L4-L5 and L5-S1 developed by contiguous extension from the adjacent chronic lumbosacral pressure sore [Figure 1]. The patient has already undergone many surgical procedures using local skin flaps (random skin flaps). Unfortunately, a full cover surgical defect wasn't achieved. A colostomy has even been performed to reduce fecal contamination of the wound. A CT scan and abdominopelvic MRI were requested pre-operatively. We staged the extension of the wound finding radiographic evidence of L4-L5 and L5-S1 spondylodiscitis [Figure 2+3]. The deep extension explained the previous failures of the surgical treatment. The surgery was performed by a multidisciplinary team (plastic, digestive and orthopedic surgery team). The surgical plan was carried out with an anterior then a posterior approach: the anterior approach was performed through a median laparotomy incision. We dissected out the omental flap and

proceeded with the treatment of spondylodiscitis. The posterior approach was used to finish up the treatment of spondylodiscitis and cover the lumbosacral pressure sore. The first step was to harvest the omental flap, which was left pedicled on the right gastroepiploic vessels [Figure 4] and protected aside in a wet gauze. Later, the lumbosacral spine was approached between the common iliac vessels. Then, we proceeded to L5 vertebral body and the L4-L5 plus L5-S1 disc removal. This choice results from the necrosis aspect of the L5 vertebral body [figure 5]. As a replacement we set up a metal implant between L4 and S1 [Figure 6]. Due to L5 destruction, we chose to pass the flap from front to back on the left side of the metal implant and the dural sac. To preserve the maximum length and vascularization of the epiploon, it was passed through the transverse mesocolon and the mesentery [figure 7].

The posterior time was performed in a prone position. We trimmed the pressure sore, and complete the vertebral reconstruction by an L3 arthrodesis to the pelvis (iliac extension screw). The flap was recovered without tension through the spine and put in place of the pressure sore wound. The vascularization was assessed by infracyanine green staining (Serb, Paris, France) with a specific camera (Hamamatsu Photonics KK, Shizuoka, Japan). The tension-free sutured flap [Figure 8] was immediately covered by a split thickness skin graft (SSTG). The spine surgery was performed by an orthopedic surgeon and the omental flap dissection was performed by a digestive surgeon. The patient was hospitalized post-operatively in intensive care unit for acute respiratory distress, and consciousness disorder. Two weeks later, the clinical condition improved and the patient was transferred to a surgical ward. A first SSTG failed. The wound dressing (mainly consisting of calcium alginate) was repeated twice a day, due to flap fluid leaks.

Corticoids creme had to be applied for several days due to the hypergranulation of the wound. Budging was complete at 30 days postoperatively [Figure 9]. A second SSTG was performed to cover the entire remaining defect. The wound healed completely at 120 days post-operative [figure 10]. Finally, the metal implant failed to integrate in the spin 5 months post-operative. The orthopedic surgeon decided to operate again on the patient in order to remove the implant, and fill in the defect with bone graft taken from the femur. The patient was discharged when the wound completely healed, 7 months post-operative.

DISCUSSION

The pedicled omental flap is a common indication in thoracic surgery for sternal osteoradionecrosis [1]. Several techniques have been described for the reconstruction of the lumbar region. In our case, it was irrelevant to plan a free flap due to the absence of available recipient vessel even more the active smoking habits (140 pack-year). The morbidity induce by the latissimus dorsi flap in the context of paraplegia (wheelchair) wouldn't be acceptable. Some authors have described the paraspinal flap in this indication [1] which was tested clinically but do not cover entirely the defect. The gluteus maximus musculocutaneous flap was not suitable [2] [3] because local flaps had already been attempted. In our clinical situation, the pedicled omental flap seemed to be the best option. When the posterior defect is median, we can choose to keep it pedicled on the right or left gastro-epiploic vessels. Anatomically, the left pedicle release is more risky because of the spleen proximity but the right pedicle is larger than the left one. We chose to keep it pedicled to the right side, because the pivot point was lower than the left, and the patient already had a colostomy (on the left side), which could have hindered his

passage in retro-peritoneal. The epiploon flap has the following advantages: large area covering, wide rotation angle, great plasticity, easy flap shaping and a reliable vascularization which guarantee a good antibiotic diffusion [4-5]. The disadvantages are those of laparotomy (herniation, intestinal obstruction on adherence, digestive wound etc ...). In our case, the use of this flap is perfectly applicable in reconstructing lumbosacral defect.

Arai et al. had reported a case of L2-L3 spondylodiscitis with bone exposure after antibiotic treatment failure. Curettage and iterative bone grafts had failed. An epiploon flap pedicled on the left gastroepiploic vessels had been achieved with complete healing at three months [7]. The authors did not specify the flap path to allow its posterior passage. Fourn et al., has published a 'case-report' of a 37-year-old paraplegic patient. The authors described a complex wound with lumbar spine exposure because of osteosynthesis material infection. They covered the defect with a right pedicled epiploon flap through the muscles of the posterior abdominal wall. [8]

In 1997, our team [4] achieved the coverage of a L2-L5 spinal osteosynthesis material exposure case in radiochemotherapy context for myeloma.

For this patient, we carried out the epiploon flap by laparoscopy, on the left pedicle with passage in a triangle between the latissimus dorsi muscle, the lateral oblique muscle, and the iliac crest by a limited latero-thoracic incision [4].

In 2017, Sambri et al. published their study about the treatment of postoperative complications after resection of malignant spinal tumors followed by radiotherapy. Patients presented a high risk of scar dehiscence, making it difficult to use locoregional

flap. All patients were treated with an omental flap reconstruction. In all the cases, surgeons used a pull-through technique to pass the flap by a posterior muscle wall incision. The average delay of complete wound healing was 36 days. [9] Finally, Oshaughnessy et al. proposed in their study to transpose an epiploon flap in a preventive way around the osteosynthesis material in spinal reconstruction, in patients at high risk of dehiscence. [10]

CONCLUSION

The omental flap can be indicated in cases of complex spinal reconstruction for material coverage. The anterior approach allows dissection of the flap which is otherwise harvested by laparoscopic way.

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FIGURE LEGENDS

Figure 1. Clinical aspect of the lumbosacral eschar.

Figure 2 + 3. Lumbosacral spine MRI and CT scan showing complete L5 destruction, L4-L5 and L5-S1 spondylodiscitis.

Figure 4. The omental right pedicled flap.

Figure 5. L5 necrosis aspect.

Figure 6. Per-operative view of the metal implant between the two iliac common vessels. The blue arrow shows the left common iliac vessel, the white asterisk shows the upper part of S1 vertebra.

Figure 7. The flap path through the mesenteric and the mesocolon.

Figure 8. Posterior view, the omental flap has covered the entire defect

Figure 9. Day 30 post-operative.

Figure 10. Day 120 post-operative



















