Left Lateral Lombotomic Mini-invasive Approach for Lumbar Vertebral Somatectomy/Vertebrectomy in Cancer Patients: Three Year Experience

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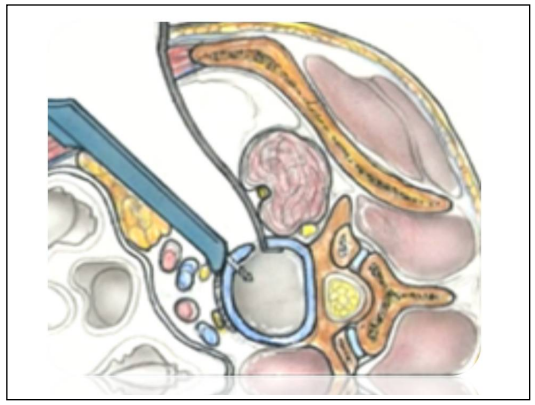
Introduction Surgical criteria for somatectomy/vertebrectomy in patients affected by spinal metastases, should be stricted, since this kind of surgery is challenging, it is burdened by a not negligible incidence of complications and it has mainly palliative aims. Symptomatic spinal cord and cauda equina compressions and/or spinal instability, and an expected survival of at least 6 months, according to the opinion of the oncologist, are reasonable indications. When a somatectomy/vertebrectomy for the lumbar tract, with the exception of L5, is required, we found that the association of a mini-invasive left lombotomic lateral approach with a lateral stabilization or a posterior approach, may offer an extremely valid alternative to the combined posterior and transperitoneal/retroperitoneal anterior approaches.

Methods Between 2012 and 2014 we have operated 7 patients with this technique. The series included 5 males and 2 females, mean age 55 years (range 45-66); two patients had multiple myeloma, two a recidive of cordoma already previously treated, three patients had respectively a breast, a rectum and a kidney cancer. All of them presented a Tokuhashi score equal or higher than 12. In five cases the vertebra L3 was involved, in one case the vertebra L2. In one case, with a recurrent cordoma, a somatectomy at three vertebral levels was subsequently necessary. A standard posterior approach in the prone position, with laminectomy, artrectomy, bilateral peduncolectomy and posterior instrumentation through transpedicular screws and rods with S4 Element® Aesculap, was performed in four patients. To complete the 360° stabilization, the patients were then fixed in lateral position, with a break in the operating table, at the level of the vertebra of interest, to increase the distance between the iliac crest and the ribs. This change of position was usually straightforward using a pneumatic depression bed. The skin incision was located amid the XIIth rib and the iliac crest, slightly more anteriorly than that for the lateral transpsoas approach, performing a sequential dissection of the external and internal oblique muscles and the trasversalis fascia layer, in order to preserve ileohypogastric and ilioinguinal nerves.



Extraperitoneal fat and peritoneal cavity were medialized with careful, blunt dissection. The lateral retroperitoneal structures were exposed with the aim to preserve the psoas fibers with gently dislocation of the entire muscle posteriorly, where it was mantained by a plastic ribbon.The lumbar plexus, continuously checked with neuromonitoring, remained posterior and it was usually visualized, only after removal of the involved vertebral body. After the somatectomy, an expandable cage (Hydrolift® Aesculap in six cases and Obelisc® Ulrich Medical in one) of adequate size and caps, adaptable to the somatic plates, was straightforward to introduce and it could be rapidly modified, if any malposition was recognized at fluoroscopy. In three patients the overall stability of the construct was implemented only by lateral stabilization, through screws and plates on the level above and below that of the somatectomy(MACS-TL® Aesculap), avoiding longer posterior stabilizations.

Fig. 1 Multiple Myeloma: L3 symptomatic "burst fracture", L2 and L4 vertebral augmentation. L3 somatectomy through a lateral approach and dural decompression. **Fig. 2** Breast Cancer: L3 metastatic lesion. Circumferential stabilization. Note surgical lateral position for L3 somatectomy after posterior stabilization. Note gentle retraction of the ileopsoas muscle and the preservation of the muscle at the end of the procedure. **Fig. 3** Rectum Cancer: L3 metastatic lesion. L3 somatectomy, lateral stabilization with MACS-TL® Aesculap.

Results No intraoperative and peri-operative complications, like neurological worsening (all our patients could ambulate before surgery except one) or dural leakage were reported in six patients.

We did not find a significant increase of haematic loss with this combined approach, neither of the hospital stay (median 7 days after surgical treatment). In the patient, affected by a L1-L2-L3 recurrent cordoma, in which a previous anterior stabilization had been already performed and a complex reconstructive surgery was necessary, we observed a post-operative dural leakage healed with spinal drainage, and a subsidence of the cage after one month from the operation, requiring a revision surgery.

Pain relief and stabilization was obtained in all patients, who remained independently ambulatory also after surgery with a mean follow-up of 17 months.

Conclusions With the left lateral lombotomic mini-invasive approach, i) the required lateral incision, is minimal, ii) the psoas muscle is preserved, without cutting the fibers and minimizing the risk of ambulatory impairment iii) previous abdominal surgery is not a matter of concern as in transperitoneal or retroperitoneal anterior approaches, iv) the overall ability to control relevant anatomic structures is increased, especially regarding the dissection of the anterior vertebral wall from the major arteries and veins, the preservation of the left ureter, the symphatetic ganglia, the dural sac and the lumbar roots, compared to the pure posterior approach, v) the lumbar somatectomy can be combined with a posterior or lateral stabilization.

Although this approach seems a reasonable compromise for L2-L3-L4 metastatic lesions, a longer follow-up and more cases are essential to draw definitive conclusions.

Learning Objectives By the conclusion of this section, participants should be able to describe an alternative surgical options for somatectomy/vertebrectomy in cancer patients affected by lumbar spinal metastases

Fig. 1

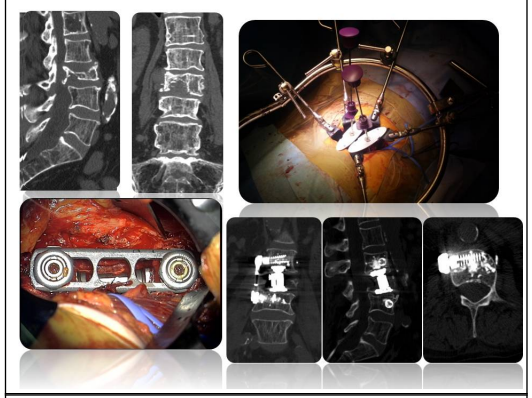


Fig. 2

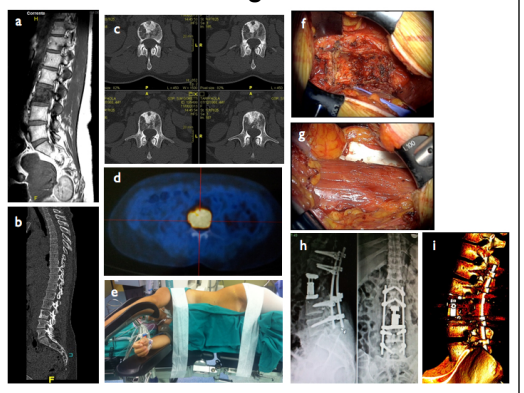


Fig. 3