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5th Meeting of the Thoracic Oncology, Thoracic Surgery, Techniques & Transplant, Respiratory Nursing and Respiratory Physiotherapy Areas of the Spanish Society of Pneumology and Thoracic Surgery (SEPAR)



10th International Workshop on Surgical Exploration of the Mediastinum and Systematic Nodal Dissection



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3rd Joint Meeting of the Spanish Society of Thoracic Surgery (SECT)



30th Congress of the "Asociación Iberoamericana de Cirugía Torácica" AIAC



FIRST RIB RESECTION BY VATS

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Thoracic outlet syndrome (TOS) is a pathology caused by compression of the brachial plexus, subclavian artery and/or subclavian vein at the level of the thoracic outlet. Surgery is one of the treatment options. The goal is to completely decompress the subclavian vessels and brachial plexus by removing the first rib and the associated scalene muscles and subclavian ligaments.

We present our technique developed and improved since 2011: Two ports are made for videothoracoscopy access, one in the seventh intercostal space in the mid-axillary line, another in the third intercostal space of the mid-axillary line, which is extended to 3 cm for the subsequent introduction of the surgical instruments for periostomy and costotomy. Exceptionally, an accessory port of 5 or 12 mm can be opened in the sixth space of the posterior axillary line. The procedure begins by identifying the first rib, which is sometimes hidden in its posterior segment due to its apical location. The parietal pleura is opened over this rib from front to back completely.

At this point, care must be taken not to injure the internal mammary vessels on the anterior margin. Once the internal surface of the first rib is uncovered, the dissection of the lower edge with periostomes begins. As the first rib is very flat, we can immediately identify its external surface, and by using traction towards the midline (downwards) of the rib, we progress the dissection of the external surface until we approach the upper edge. This is the hot point of the intervention and it is essential to identify, both above and below the rib, the subclavian vessels and the brachial plexus. At this point, with enough traction, the rib descends a few centimeters and allows perfect visualization of the subclavian vein and artery, although it will still be strongly anchored by the scalene muscles. As the subclavian vein is now controlled, the anterior edge of the first rib is sectioned at its junction with the sternum. In addition to sectioning the costal cartilage, the strong ligament that attaches the rib to the clavicle must be dissected and divided.

Once the anterior edge of the first rib and the costoclavicular ligament have been cut, the rib descends much more easily under traction from the anterior portal and the dissection of the upper edge of the rib can continue.

The next step is the section of the scalene, with the traction should be very well exposed between the subclavian vein and the subclavian artery. Once the anterior scalene muscle is divided, the rib is easy to move and the dissection becomes much simpler. The release of the rib towards the spine is continued. Once the entire rib has been removed, it is extracted through the upper incision and hemostasis is meticulously checked. A posteroinferior pleural drain is left for at least 24 hours.

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3. Costantino CL, Schumacher LY. Surgical Technique: Minimally Invasive First-Rib Resection. *Thorac Surg Clin*. 2021 Feb;31(1):81-87. doi: 10.1016/j.thorsurg.2020.09.004. PMID: 33220774.