SAR Journal of Medicine

Abbreviated Key Title: *SAR J Med*
Home page: https://sarpublication.com/journal/sarjm/home
DOI: 10.36346/sarjm.2024.v05i02.001

ISSN 2707-773X (P)
ISSN 2709-6920 (O)

Original Research Article

Surgery for the Thoracobrachial Crossing Syndrome by a Supernumerary Rib: About a Case

Meskouri Karim[1*], Badache Kenza[2], Cherbal Abdellah[3]
[1]Professor Head of Department of Thoracic and Cardiovascular Surgery and Organ Transplantation, Mustapha University Hospital, Alger, Algeria
[2]Professor of Neurosurgery, CHU Mustapha, Alger, Algeria
[3]Thoracic Surgeon, CHU Mustapha, Alger, Algeria

***Corresponding Author:** Meskouri Karim
Professor Head of Department of Thoracic and Cardiovascular Surgery and Organ Transplantation, Mustapha University Hospital, Alger, Algeria

Article History: | Received: 14.02.2024 | Accepted: 27.03.2024 | Published: 03.04.2024 |

Abstract: Thoraco-brachial outlet syndrome is little known to the general public. However, it is a relatively common pathology, which generally corresponds to nerve compression in the neck and shoulder region. They would involve compression of the lower trunk of the brachial plexus sometimes of the subclavian vessels as these structures cross the thoracic outlet. The diagnosis is difficult, and gives rise to frequent medical errors and the methods have not been well established. Treatment includes physiotherapy, painkillers and, in the most complex cases, surgery due to mechanical stress. We report the case of a 39-year-old patient suffering from poorly systematized pain in the right upper limb associated with paresthesia and cramps and edema. The radiological assessment revealed a SDTB per supernumerary cervical rib with partial compression of the subclavian artery and vein. She benefited from a resection of the supernumerary rib and release of the crossing followed by physiotherapy. The surgical excision of this rib resulted in complete indolence the day after the operation, lasting one year later. The aim of this article is to present the surgical procedure for this pathology and the interest of which is to recall the physiopathology, the diagnostic means, the indications and the therapeutic strategy.

Keywords: Thoraco-Brachial Parade Syndrome, Supernumerary Rating, Surgery, Physiotherapy, Benefit.

INTRODUCTION

Thoraco-brachial outlet syndrome is little known to the general public. However, it is a relatively common pathology, which generally corresponds to nerve compression in the neck and shoulder region. They are a group of poorly defined disorders characterized by painful symptomatology and dysesthesias of the hand, neck, shoulder or arm [1].

They would involve compression of the lower trunk of the brachial plexus in the thoraco-brachial passage, (Fig 1) that is to say the area located between the clavicle and the first rib sometimes of the subclavian vessels at the moment where these structures cross the thoracic outlet. Diagnostic methods have not been well established [1, 2].

The frequency is estimated between 0.3 and 0.7% of the population. (Very underestimated), it would be at least 1 to 2% of the population [3-6].

Cervical rib syndrome is characterized by the existence of an additional cervical rib. This supernumerary rib arises at the seventh cervical vertebra. (Fig 2) This is a congenital anomaly located above the normal first rib. This cervical rib is relatively common, found in 1.21 to 2% of the general population during medical examinations. It was the French anatomist François-Joseph Hunauld who first described this syndrome, at the beginning of the 15th century [5-7]. Brachial plexus compression can be identified by weakness in the muscles of the hand, near the base of the thumb. Compression of the subclavian artery is often diagnosed during a clinical test of the Adson maneuver allowing the detection of vascular compression in the context of cervical rib syndrome as well as thoracic outlet syndrome [5-7].

Systematic brachial plexus tensioning tests in patients with orthopedic pathology of the upper limb are often positive in 60% of cases (Fig 3) even though these patients have no complaints. (Atasoy) [2].

It is a pathology which mainly affects young people (20-60 years), and more often women with a difficult diagnosis, and gives rise to frequent medical wanderings [3].

Treatment includes physiotherapy, painkillers and, in the most complex cases, surgery.

MATERIALS AND METHODS

We report the case of surgical treatment of a thoraco-brachial crossing syndrome caused by a right supernumerary dimension in a 39-year-old woman who has been suffering from cramp fatigue for several years; paresthesias as well as edema of the right upper limb; the clinical examination using the ROSS test and the ADSON tests came back positive [5-9].

An X-ray of the cervical spine (Fig 4) revealed the existence of a right supernumerary dimension and confirmed on cervicothoracic CT (Fig 5) with compression of the vascular-nervous bundle, Doppler to clarify the vascular compression and the electromyogram has confirmed the nervous suffering.

The patient underwent surgical resection under general anesthesia via the supraclavicular route (Fig 6).

The basic surgical procedure was the systematic release of the vascular-nervous bundle carried out under general anesthesia followed by resection of the Supernumerary Side (Fig 7) with section of a fibrous ligament and systematic section of the Scalene muscles and installation of a redon. The length of hospitalization was 3 days for our patient.

RESULTS

We regularly monitored our patient in consultation essentially at the rate of 15 days, 3 months, 6 months, 1 year, then every year. Redirected after 01 month post op to rehabilitation for physiotherapy.

The evolution was favorable with clear and significant regression of the symptoms and complete disappearance of all clinical signs four months after the intervention.

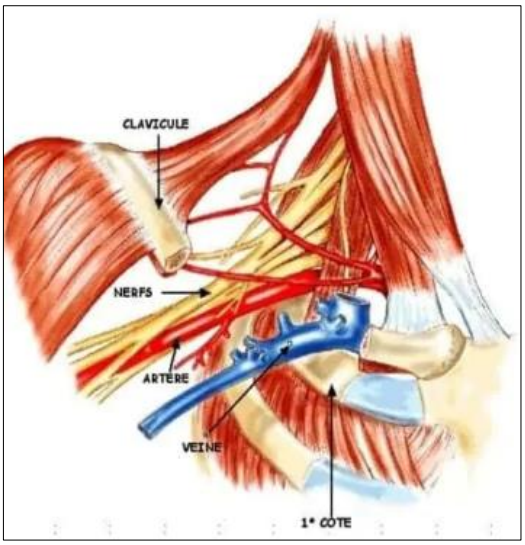

Fig. 1: Cervico-thoracic parade

Fig. 2: Cervical rib. (Diagram)

Fig. 3: Orthopedic pathology of the upper limb

Fig. 4: Standard x-ray shows the cervical rib (K. Meskouri collection)

Fig. 5: Scanner: Right supernumerary rib - Front and back view (K. Meskouri collection)

Fig. 6: Supraclavicular approach

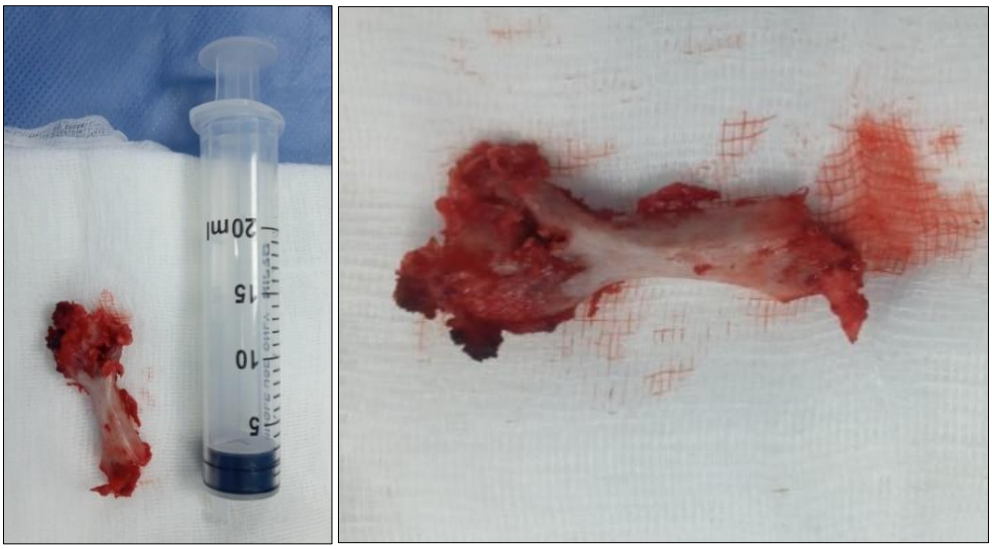

Fig. 7: supernumerary rating after resection (K. Meskouri collection)

DISCUSSION

Treatment of STTB is a difficult challenge for therapists. Rehabilitation protocols generally use stretching exercises (closing muscles), muscle toning (opening muscles) and active postural re-education [3].

Although giving satisfactory results, these protocols are responsible according to certain authors [6], and [8], for insufficient results, requiring the use of surgery and various randomized studies have been carried out to study the effectiveness of the surgery. In the literature, the supraclavicular route gives around 90% excellent and good results when it comes to a cervical rib with scalenotomy or fibrous tracts. The Roos axillary approach is a reliable technique in very trained hands for vascular or neurovascular forms with resection of the 1st rib [7].

We have opted to set up a rehabilitation program for pre- and post-operative patients. This strategy seeks to restore mobility of the cervical spine; of the shoulder girdle and shoulder joints using joint normalization and muscle release techniques.

The results obtained in our case after surgical excision of this rib resulted in complete indolence the day after the operation, lasting one year later, which encourages our therapeutic option. Vascular compression always constitutes a serious criterion.

Also in our context, the strategy of accompanying surgery with physiotherapy pre- and post-operatively offers many advantages.

Is it Necessary to Operate on Thoraco-Brachial Syndrome?

No, the first therapeutic step is conservative treatment which, most of the time, is sufficient [8, 9]. This conservative treatment requires numerous sessions with a physiotherapist over several weeks [4].

Surgical treatment only intervenes for obvious deficient forms or when an identified anatomical obstacle is highlighted (Supernumerary rating) [10, 11].

CONCLUSION

Consider this thoracic outlet syndrome in cases of unexplained pain and paresthesias that begin at the neck or shoulder and extend along the medial part of the arm. Perform electrophysiological tests.

Consider surgery in cases of cervical rib or subclavian artery compression and neurovascular deficits that progress despite conservative treatments followed by postoperative physiotherapy.

Physiotherapy is the cornerstone of the treatment of cervico-thoraco-brachial crossing syndrome.

The absence of recurrence highlights the excellence of the Therapeutic strategy adopted in the management of STTB with well-conducted surgical TRT to avoid recurrence of the symptoms and always associated with well-adapted Physiotherapy.

Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. Poitevin, L. A. (1991). Compressions at the cervico-brachial confluence. In: Tubiana R. – Treatise on Hand Surgery, Paris. *Masson*, *4*, 362-378.
2. Atasoy, E. (1996). Thoracic outlet compression syndrome. *Orthopedic clinics of North America*, *27*(2), 265-303.
3. Bouchet, J. Y., Richaud, C., & Franco, A. (1984). Thoraco-brachial crossing syndrome and its rehabilitation. Ann. *Physiotherapy*, *11*, 83-88.

4. Prost, A. (1990). Place of physiotherapy in the treatment of thoracic-brachial crossing syndrome. Scientific *physiotherapy*, *288*, 5-22.
5. Adson, A. W., & Coffey, J. R. (1927). CERVICAL RIB*: A METHOD OF ANTERIOR APPROACH FOR RELIEF OF SYMPTOMS BY DIVISION OF THE SCALENUS ANTICUS. *Annals of surgery*, *85*(6), 839-857.
6. Merle, M., & Borrely, J. (2004). Cervico-thoraco-brachial crossing syndromes. In: *Canal syndromes*. 23, Supp 1.
7. Midha, R., & Zager, E. (2008). Surgery of peripheral nerves. Thieme ED. NY.
8. Narakas, A. (1990). Therole of thoracic outlet syndrome in the double crush syndrome. Annals of Hand and Upper, limb, *Surgery*, *95*, 331-40.
9. Roos, D. B. (1979). New concepts of thoracic outlet syndrome that explain etiology, symptoms, diagnosis, and treatment. *Vascular Surgery*, *13*(5), 313-321.
10. Walden, M. J., Adin, M. E., Visagan, R., Viertel, V. G., Intrapiromkul, J., Maluf, F., ... & Yousem, D. M. (2013). Cervical ribs: identification on MRI and clinical relevance. *Clinical imaging*, *37*(5), 938-941. DOI 10.1016/j.clinimag.2013.01.005.
11. Viertel, V. G., Intrapiromkul, J., Maluf, F., Patel, N. V., Zheng, W., Alluwaimi, F., ... & Yousem, D. M. (2012). Cervical ribs: a common variant overlooked in CT imaging. *American Journal of Neuroradiology*, *33*(11), 2191-2194. DOI 10.3174/ajnr.A3143.