Cervical Rib: Dept of Neurosurgery Khoula Hospital Muscat Oman Experience: A Critical Analysis

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Abstract

An extra rib arising from seventh cervical vertebra is termed as cervical rib. The condition is a congenital anomaly. Thoracic outlet syndrome is the common presentation. [1] Resection of the rib alleviate the symptoms. We present here our experience of cervical rib resection and a critical analysis of condition with literature review.

Keywords: Cervical rib

Cite This Article: Ali Al Mashani, Neeraj Salhotra, Azmat Ali, Munthir Al Zabin, Salim Al Abri, Arshad Kabir Khan, and Ahmed Al Risi, “Cervical Rib: Dept of Neurosurgery Khoula Hospital Muscat Oman Experience: A Critical Analysis.” American Journal of Medical Case Reports, vol. 5, no. 2 (2017): 43-47. doi: 10.12691/ajmcr-5-2-6.

1. Introduction

Cervical rib is known to have an incidence of .6% in the population. It can be either bilateral or only on one side. Thoracic outlet syndrome is the common presentation. However a major population cervical rib is detected incidentally and patients are asymptomatic. [1] Size and shape of the cervical rib also has different anatomic profile. Persistent ossification of the C7 lateral costal cartilage is attributed to the formation of cervical rib. Hence elongation of transverse process or a complete cervical rib or fusion to the 1st rib are various anomalies which are encountered. Inferolateral projection in comparison to the normal anterolateral projection of thoracic transverse process is the differentiation for the cervical rib. Brachial plexus compression or subclavian artery compression by cervical rib leads to positive Adson’s test on examination. Excision of the rib via various approaches, superaclavicular, trans axillary or inferaclavicular is generally practiced [4].

Superclavicular approach via small incision in the scalene triangle was the choice of operating consultant. After retracting the clavicular head of the sternocleidomastoid muscle the scalene anterior muscle with phrenic nerve crossing it from lateral to medial size was appreciated. The Subclavian vein was seen anterior to scalene anterior artery and brachial plexus were seen between the scalene anterior and medial muscle. Cervical rib was seen here causing the compression of neurovascular bundle. Post stenotic dilatation of subclavian artery was not noticed in our series of patients. After careful retraction of neurovascular bundles the excision of cervical rib was performed subperios teally till C7 vertebra removing all compressing elements on scalene triangle neurovascular structures. Pleural injury was carefully avoided. Haemostasis was achieved adequately and closure of wound was done in a conventional way.

3. Results

The patients are tabulated as per Figure 5. Age of our patients ranged from 16 yrs to 46 yrs. Male female ratio was 2:6. Presentation was neck pain with cervical radiculopathy in 6 patients and in two had associated hand pain and numbness too. One patient required later carpal tunnel decompression too. Adson test was positive in 4 of our patients. Investigations done were Xray, CT scan, MRI cervical spine and EMG/NCV studies in all of our patients. MRI cervical spine was done to rule out any associated disc disease. In two patients rib was bilateral. One was symptomatic only on one side other had on both sides and required two surgeries. Surgical approach in all patients was superaclavicular. Complications included in one patient persistence of symptoms and required decompression of carpel tunnel syndrome too. Other all
patients improved in the symptoms. Patients are all being followed up in outpatient clinic.

Table 1.

| S.No | Hospital ID No. | Sex   | Age  | Symptoms                          | Investigation                  | Date of surgery          | Complications | Follow up          |
|------|----------------|-------|------|-----------------------------------|--------------------------------|--------------------------|---------------|--------------------|
| 1    | 480171         | Female| 36 yrs | Bilateral hand and neck pain      | X ray, CT, MRI and EMG/NCV     | 5/4/2006 left, 14/5/2006 right | nil           | 1 yr Satisfactory  |
| 2    | 492761         | Female| 39 yrs | Pain left side neck and hand      | X ray, CT, MRI and EMG/NCV     | 7/6/2006                 | nil           | 3 yrs Satisfactory |
| 3    | 351660         | Female| 37 yrs | Left hand numbness                | X ray, CT, MRI and EMG/NCV     | 18/9/2006               | Was symptomatic required carpal tunnel decompression too | 7 yrs satisfactory |
| 4    | 377249         | Female| 38 yrs | Pain and numbness in left sided limbs | X ray, CT, MRI and EMG/NCV     | 1/11/2006               | nil           | 7 yrs satisfactory |
| 5    | 66654          | Female| 58 yrs | Left sided pain and numbness      | X ray, CT, MRI and EMG/NCV     | 22/6/2009               | nil           | 1 yr Satisfactory  |
| 6    | 697916         | Male  | 45 yrs | Left sided neck pain              | X ray, CT, MRI and EMG/NCV     | 20/11/2011              | nil           | Lost to follow up  |
| 7    | 789762         | Female| 46 yrs | Right sided neck pain and numbness | X ray, CT, MRI and EMG/NCV     | 20/1/2014               | Nil           | One follow up in OPD after 2 months satisfactory |
| 8    | 508752         | Male  | 16 yrs | Left sided neck pain and numbness |                                  | 23/1/2017               | nil           | Immediate post op period uneventful awaits follow up in OPD |

Figure 1. CT scan of Patient no 2 showing left sided cervical rib
Figure 2. X-ray neck showing right sided cervical rib of patient no 7

Figure 3. CT and X-ray of patient no 4 showing left sided cervical ribs
4. Discussion

As reviewed in the literature cervical rib is not an uncommon entity but mostly managed by thoracic or vascular surgeons. As we further review the literature Ferrante MA and Ferrante ND in 2016 reported the thoracic outlet syndrome caused by cervical rib into various categories viz arterial, venous, neurovascular and disputed thoracic outlet syndromes categories and their management thereof. Cervicoscapular pain has to be studied carefully to be distinguished from true thoracic outlet syndrome by carefully seeing anatomy, neurophysiology, electromagnetic correlations and underlying pathology. [1] Buyukkaya A Buyukkaya R in 2015 reported incidences where a cervical rib was mimicking a supraclavicular mass. [2] 1st rib itself or lesions thereof can present as TOS as reported by Kargar S et al in 2013 who reported a case of osteoid osteoma of the 1st rib and case presented as thoracic outlet syndrome. [3] In 2009 White PW et al discussed in detail the cervical rib causing the arterial type of TOS with subclavian artery compression and etiology, pathophysiology, diagnostic and treatment plans were discussed. [4] In 1983 Neveu P et al described their 15 cases of cervical ribs causing various set of pathophysiologies and role of ultrasound and computed angiography as useful tool in the management. [5] In 2011 Rivera-Vega A reported a case of bilateral cervical rib in an adolescent with fibrotendinous band being the reason for TOS and atrophy of hand muscles along with other neurogenic presentation treated by surgical excision of the rib with band on symptomatic side. [6] In Our case series youngest patient being matching this case report and establishing the treatment standards. In 2006 Hug U et al further emphasized patients presenting with thenar muscles hypotrophy and on investigations reveled cervical rib, enlarged C7 transverse process or a fibrotendinous band as a causative feature and surgical resection gave encouraging result [7].

To conclude our study further emphasised the TOS caused by cervical rib as a challenging condition. Thorough investigation with EMG/NCV, CT/X ray and MRI cervical spine to rule out associated cervical radiculopathy being the standard array of investigation prior to supraclavicular approach for excision of the cervical rib. Our small group owing to small population of country had negligible complications and good outcome.

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