

Prevalence of Cervical Rib in Western Nepal

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ABSTRACT

Introduction: Cervical rib is usually asymptomatic. It is usually detected incidentally when radiograph is done for other reasons. Cervical rib has been found to be symptomatic in about 10% of cases. This study was carried out to evaluate the prevalence of cervical ribs and percentage of symptomatic patients among Nepalese population in western development region.

Methods: Total of 3600 chest and cervical spine radiographs of patients done for various purposes in radiology department were evaluated for presence of cervical rib. Study was carried out during September 2013 to February 2014. Patients of 16 years and above were included in the study. History was also noted to see if patients with cervical rib were symptomatic. SPSS version 17 software was used in data analysis.

Results: Prevalence of cervical ribs was found to be 1.1 % with higher rate in females. Among 39 patients with cervical rib; bilateral cervical ribs was seen in 46.2 %. Cervical rib was more common on right side, seen in 38.5 % of cases. It was seen on left side in 15.4 % of cases. Cervical rib was found to be symptomatic in 10.25 % of patients. Among them; two patients presented with pain in arm and other two presented with hard swelling in right cervical region.

Conclusion: The cervical rib is common in our population. Patients with pain, numbness in arm and swelling in cervical region should be evaluated for cervical rib.

Keywords: Cervical rib, Compression, Neurovascular symptom

INTRODUCTION

Cervical rib is an extra rib arising from seventh cervical vertebra. It can also arise from fifth or sixth cervical vertebra as described by Tubbs et al.¹ It is thought to be produced as a result of excessive growth of anterior tubercle of the cervical vertebra. It can be unilateral or bilateral varying from a simple exostosis of the costal element to a fully formed rib. Its occurrence vary from 0.58% to 6.2% depending on the population and region.^{2,3}

Cervical rib is usually asymptomatic. It is usually detected incidentally when radiograph is done for other reasons. Cervical rib has been found to be symptomatic in about 10% of cases.^{4,5} Patients with cervical rib may present with features of thoracic outlet syndrome like pain, numbness and tingling sensation in arms. They may also present with hard swelling in cervical region. This study was undertaken as there is no documented report on its prevalence in Nepalese population. This study aims to find the prevalence of cervical ribs and percentage of symptomatic patients with cervical ribs among Nepalese population in western development region.

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METHODS

This study was a prospective cross sectional study conducted over a period of six months in western Nepal. All the chest and cervical spine radiographs done for various purposes were studied for presence of cervical rib. Patients of 16 years and above were included in the study. This study was conducted from the period of September 2013 to February 2014. A total of 3600 radiographs were included in study. Radiographs with obvious pathology obscuring the bony shadows were excluded from the study. Patient's information including age, sex, presence or absence of cervical rib, side of occurrence and presence or absence of symptoms was recorded. Data were analyzed using SPSS 17.0 software. Ethical clearance for this study was obtained from the hospital ethical committee.

RESULTS

A total of three thousand six hundred chest and cervical spine radiographs of patients done for various purposes were analyzed. Patients of 16-90 years were involved in the study. The mean age was 48.99 ± 19.02 years. Females included 47.8 % of study population and 52.2 % were males. Prevalence of cervical rib was found to be 1.1 %. It was higher in females; seen in 53.8 % of cases. Among 39 patients with cervical rib; bilateral cervical ribs (Figure 1) was seen in 46.2 %. Cervical rib was more common on right side, seen in 38.5 % of cases (Figure 2). It was seen on left side in 15.4 % of cases. Overall prevalence of unilateral cervical rib was more than bilateral ribs (Table 1).

Table 1: Distribution of cervical rib.

	Frequency	Percent
Absent	3561	98.9%
Bilateral	18	0.5 %
Right	15	0.4 %
Left	6	0.2 %
Total	3600	100 %

Two patients with cervical rib on right side presented with hard swelling in right cervical region and two patients with bilateral cervical ribs presented with pain in the arm. Hence 10.25 % of patients were found to be symptomatic.

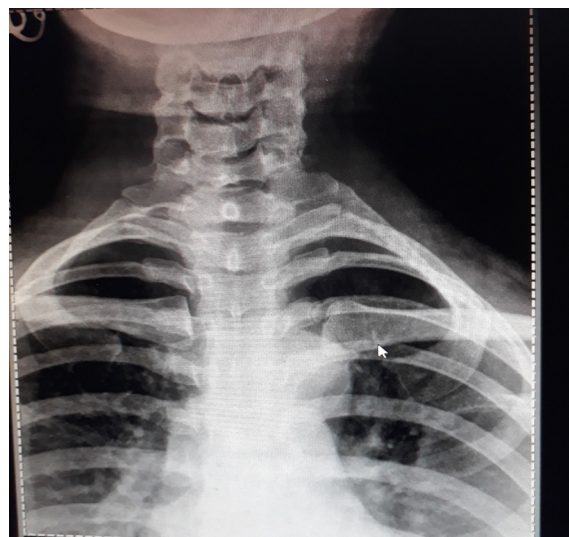


Figure 1: Bilateral cervical



Figure 2: Right cervical rib.

DISCUSSION

Cervical rib is usually asymptomatic. But, it can be an important cause of neurovascular compression at the thoracic inlet in some patients. In our study, most of the patients with cervical ribs were asymptomatic. Only 5.12 % of patients with cervical rib presented with features of neurovascular compression.

Prevalence of cervical ribs has been found

to vary in different part of world. Result of our study falls within the range reported by previous studies in various populations, from 0.05% to 3 %.^{6,7} Our result is similar to study done in central India by D.K. Sharma et al, who found prevalence of cervical rib to be 1.22 %.⁸ Prevalence rate on Americans was found to be 0.5-1 %.⁹ Brewin et al⁵ found a prevalence rate of 0.74% in a mixed sex and ethnicity population in London. Ebite et al found an overall incidence of 0.58%.² Ani et al studied prevalence of cervical rib in Nigerian population and found to be 0.7%.¹⁰ Prevalence rate in our study is slightly higher than above mentioned study and lower than few other study which reported to be 2.67 %¹¹ & 3.4 %¹². Similar to previous studies^{2,10-14}; our study also shows higher prevalence of cervical rib in females than in males. As with previous studies^{2,10-16}; there were more unilateral cervical ribs than bilateral and more on right than left.

The different observations of prevalence rate in different population may be due to differences in race and ethnicity, the sample size, and the imaging techniques used. Sample size and imaging technique used in different studies was different. Using a digital radiography may lead to higher resolution. In contrast to conventional radiography one can alter brightness & contrast with digital radiography and hence higher chances of detection of cervical rib. No other study has been done regarding prevalence of cervical rib in other part of our country. Hence, we could not compare our result with study in other part of Nepal. In future; we can conduct similar study in other part of our country using larger sample size and according to race and ethnicity.

CONCLUSION

Prevalence rate of cervical rib is high (1.1 %) in our population and more common in females. Unilateral rib was more common

than bilateral ribs in our study. Keeping in mind the high prevalence rate of cervical rib, patients with cervical and arm pain need to be evaluated for this entity.

REFERENCES

1. Tubbs RS, Muhleman M, Miller J. Cervical ribs with neurological sequelae in children: a case series. *Childs Nerv Syst* 2012 Apr 1;28(4):605–608.
2. Ebite LE, Igbigbi PS, Chisi JE. The prevalence of true cervical rib in adult Malawian population. *J Anat Sci* 2005;(1):7-9.
3. Erken E, Ozer HTE, Gulek B, Durgun B. The association between cervical rib and sacralization. *Spine* 2002;27(15):1659–1664.
4. Brewin J, Hill M, Ellis H. The prevalence of cervical ribs in a London population. *Clin Anat* 2009;22: 331-336.
5. Roos DB. Congenital anomalies associated with thoracic outlet syndrome: anatomy, symptoms, diagnosis, and treatment. *Am J Surg* 1976;132:771–778.
6. Gulekon IN BC, Turgut HB. The prevalence of cervical rib in Anatolian population. *Gazi Med J* 1999;10:149–152.
7. Steiner HA. Roentgenologic manifestations and clinical symptoms of rib abnormalities. *Radiology* 1943;40:175–178.
8. Sharma DK, Vishnudutt, Sharma V. *Int J Appl Basic Med Res* 2014;3(2):593-597.
9. Rayan GM (1998): Thoracic outlet syndrome. *J shoulder Elbow Surg* 1998;7(4):440-451.
10. Ani CC, Adegbe EO, Ameidaji M, Gabkwet A. Cervical rib variant in a Nigerian population. *Jos J Med* 2012;6:60-62.

11. Palma A, Carini F. Variation of the transverse apophysis of the 7th cervical vertebra: Anatomico-radiological study of an isolated population. *Arch Ital Anat Embriol* 1990;95:11-16.
12. Bokhari RF, Al-Sayyad MJ, Baeesa SS. Prevalence of cervical ribs and elongated transverse processes in Saudi Arabia. *Saudi Med J* 2012;33:66-69.
13. Tryfonidis M, Anjarwalla N, Cole A. Incidence of cervical rib in the white British population and direct comparison with the incidence in the Asian population: A radiological study. *J Bone Joint Surg Br* 2010;92:4:499.
14. Viertel VG, Intrapromkul J, Maluf F et al. Cervical ribs: A common variant overlooked in CT imaging. *Am J Neuroradiol* 2012;33:2191-2194.
15. Etter LE. Osseous abnormalities of the thoracic cage seen in forty thousand consecutive chest photoroentgenograms. *Am J Roentgenol* 1944;51:359-363.
16. Singh H.K. Incidence of congenital rib anomalies. *Indian J Chest Dis* 1973;15:157-164.