"A RADIOLOGICAL STUDY OF PREVALENCE OF CERVICAL RIBS IN POPULATION OF UTTAR PRADESH"

DISSERTATION

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CERTIFICATE

This is to certify that the dissertation "A radiological study of prevalence of cervical ribs in population of uttar pradesh" is a bonafide and genuine research work of Jitendra kumar necessary for award of degree of Master of Science in Medical Anatomy for the Session : 2021-22, under my supervision and guidance of Dr.Mahboobul Haque in the Department of Anatomy, IIMS&R, Integral University, Lucknow.

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I hereby declare that this dissertation "A Radiological study of prevalence of cervical ribs in population of Uttar Pradesh"is a bonafide and genuine research work carried out by me as per the Research Committee and Ethical Committee guidelines of IIMS&R, under the guidance of Prof. Dr. Mahboobul Haque, Department of Anatomy, Integral Institute of Medical Sciences & Research, Integral University, Lucknow U.P.

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LIST OF ABBREVIATIONS

Fig.	Fig.
>	Greater Than
<	Less Than
Min.	Minimum
Max.	Maximum
S. No.	Serial Number
Mean	Mean
SD	Standard Deviation
R – Value	Correlation Coefficient
p – Value	Probability Value
CR	Cervical Rib
Bil.	Bilateral
Uni.	Unilateral
Uni. R-S	Unilateral Right-Side
Uni. L-S	Unilateral Left-Side
TOS	Thoracic Outlet Syndrome

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JITENDRA KUMAR

CONTENTS

INTRODUCTION

Cervical Rib is expressed as an anomalous, super-numerary extra rib which arises from the seventh cervical vertebra.

Cervical rib is the costal element of seventh cervical vertebra perhaps a scanty epiphysis on its transverse process, but more frequently it consist of head,neck and tubercle. if a shaft is there, it is of variable length, expand antero-laterally into the posterior triangle of the neck, where it can end freely or attach the first rib or costal cartilage or sternum. It is usually fibrous in nature, however in some cases it can undergo ossification. (1)

The axial skeleton layout is determined by "HOX GENE" and mutation within them are likely related to emerge of cervical ribs.

The ossification of the cervical rib resembles that of a standard cervical vertebra. Additionally during the sixth month of intrauterine life, each costal process has its own centre, which emerges with the body as the transverse process during the fifth to sixth year of life.

A cervical rib can develop from the costal element of the seventh cervical vertebra.

A cervical rib is an extra rib that arises from the seventh Cervical spine (C7) vertebra. Afterwards, it attaches to the first rib close to the location where the Scalenus anterior inserts If the cervical rib is more than 5 cm long, it mostly displaces the branchial plexus and sub-clavian artery upwards.(2).

Vertebral bones can be seen in parts. On each side, costo-transverse joints are visible due to significant amount of calcium they contain. Posterior portions of the rib are easier to observe. As they move anteriorly, the rib gets wider and thinner. If the cartilage are not calcified then they cannot be seen. (3)

Etiology of Cervical rib take place approximately 1% of the population. It causes symptoms only in 10% of cases. Symptoms are very rare in children, but are most commonly seen in women in 3rd and 4th decades. Frequently, a well developed musculature make susceptible for compression. Females with long narrow necks can lead to few variations in anatomy of the head and neck. Gradual descending of the shoulder girdle may be from atrophy of the local musculature can cause onset of symptoms in the 2nd or 3rd decade.(4)

Pathological compression of the brachial plexus generally affects its lower trunk (C8 & TI) where the Ulnar nerve is mainly involved. Vascular features can be intermittent from compression or temporary occlusion of the sub-clavian artery.

Clinical Features of Thoracic outlet syndrome differ depending on the compression of either nerves or blood vessels or both. Preponderance of patients are middle-aged women. However, younger group can also be involved. Routinely, symptoms of compression on either nerves or blood vessels dominate.(4).

Neurological manifestation are numbness, paraesthesia and pain generally present in fingers and hands along ulnar nerve distribution. Pain is insidious on onset and generally distributed. It usually involves the neck, shoulder, arm, hand and fingers. It can even radiate to the anterior chest or posteriorly to the parascapular region. Numbness and paraesthesia are more precise distribution and mainly involve with the cutaneous skin supplied by C8 and TI (ulnar nerve distribution). Subsequently neurologic deficits can develop in the form of motor weakness, sensory loss and atrophy.(4).

Vascular manifestations of arterial compression are seen less commonly in about 1/4th of cases. It consist of paraesthesia, numbness, pain, coldness and weakness of the arm or hand. These features are accentuated by exposure to cold and exercise. Distal end embolization may cause Reynaud's phenomenon, which in later cases can cause digital ulceration and even gangrene. The venous features include pain, oedema, venous distension and cynosis. (4)

Differential Diagnosis of the Thoracic outlet syndrome.

1. Cervical spondylosis
2. Protrusion of cervical disc
3. Compression of cervical cord
4. Brachial neuritis
5. Reynaud’s phenomenon
6. Carpal-Tunnel Syndrome

REVIEW OF LITERATURE

Adibatti Mallikarjun Ningappa et al 2022 (5) have carried out a study on 650 cervical spine and chest x-rays (356 males and 294 females) in the Employees State Insurance Corporation Medical College and Hospital Chennai, Tamil Nadu. They have found seven cases of cervical ribs, thoracic outlet syndrome and brachial plexopathy to prevent a neurovascular and life threatening complication.

Iftikhar Shazia et al 2020(6) have conducted a study on 1038 chest X-rays (515 Males & 523 Females) in Khyber Medical College Peshawar, Pakistan. They have reported four cases of cervical ribs (1 Males & 3 Females). Prevalence of cervical ribs mostly found in Females (around 0.38%) as compared to males. Mutation of Hox gene causes occurrence of cervical rib.

Suzuki Taku et al 2020(7) have examined a case of familial cervical ribs presence (a 53 year old female and 20 years old daughter) in Kieo University School of Medicine, Tokyo, Japan. They have reported the overall presence of cervical ribs in approximately 0.2% to 0.5% of the population. The cervical ribs trap the brachial plexus, cause a motor and sensory disruption (thoracic outlet syndrome). Given that the expression of the HOX gene is known to play a role in the formation of cervical ribs, their presence in these patients show a familial propensity.

Bajpai Roshni et al 2019(8) have conducted a study on 100 cervical ribs using Chest and cervical spine X-rays In Kempegowda Institute of Medical Sciences, Bangalore. They have found only six cervical ribs occurences mainly in females associated with thoracic outlet syndrome.

Shinwari Jan Abdullah et al 2019(9) have carried out an investigation in 800 patients in Nangarhar University, Radiology and Anatomy Department at Jalalabad Afganistan. They have found 20 persons with the presence cervical ribs (8 Males & 12 Females). There was unilateral predominance.

Agarwal Shushant et al 2018(10) have reported 63 cervical ribs cases (20 males & 43 females) out of 8000 chest & cervical spine X-rays in Guwahati Medical College and Hospital, Guwahati, Assam. The reported prevalence of cervical ribs is around 0.75%.

Chakrawarti Kosuri Kalyan et al 2018(11) have conducted a study on 220 chest& cervical spine X-rays (110 Males & 110 Females) in Varun Arjun Medical College, Shahjahanpur, Uttar Pradesh. They have reported the presence of bilateral cervical ribs in three adult female patients which was used for appropriate treatment of compressive neuropathies.

Iqbal Khadija et al 2018(12) have conducted a study on 150 chest X-rays (92 Males & 58 Females) in Radiology Clinic Rawalpindi & Islamabad. The presence of cervical ribs was detected in 8.69% Males & 5.17% Females.

Sikander Shahjad et al 2017(13) conducted study on 1000 chest & cervical spine X-rays (460 males & 540 females) in Department of Radiology Ziauddin University Karachi, Pakistan and found 36 cervical ribs cases (24 females and 12 males). In this study, prevalence of cervical ribs & elongated transverse process is slightly higher than reported in other population.

Ho Yunusa – Kolade et al 2017(14) have carried out a study on 1520 chest & cervical spine X-rays (950 males and 570 females) in the University of Abuja Teaching Hospital in Nigeria. They have found only 6 cases of cervical ribs presence which is around 0.6% and 0.7% of studied population.

Spadlinski Lukasz et al 2016(15) have published a review article on the presence cervical ribs in humans and have reported that Cervical ribs presence vary from 0.58% in Malaysian population to 6.2% in Turkish population. They concluded that the early identification of cervical ribs may prevent life-threatening complications.

S Lalchand et al 2016(16) have analyzed 3600 chest and Cervical spine X-rays in Manipal Teaching Hospital, Pokharan, Nepal and found the prevalence of cervical ribs around 1.1% population. They have concluded that the patients with numbness in arm and swelling in cervical region should be evaluated for cervical ribs.

Ezeafer S.N. et al 2016(17) have studied 6571 chest & cervical spine X-rays in Department Radiation Medicine College of Medicine, University of Nigeria. They have found 48 cervical ribs cases (43 Females & 5 Males). Out of 48 cases, 27 were bilateral and 21 were unilateral (8 left-side and 13 right-side). There was no age related variability with prevalence. Cervical ribs prevalence in the studied population. Prevalence of cervical ribs in this study is around 0.7%.

Bhat Hamid Mudaris et al 2015(18) have conducted study on 2000 chest and cervical spine X-rays in Government Medical College & Hospital Shrinagar, Jammu & Kashmir. They found 67 cervical ribs cases.

Dashti Gholamreza et al 2015(19) have studied 170 cervical spine & chest X-rays (94 females & 76 males) in University of Medical Sciences, Isfahan, Iran. Around 14 patients were evaluated for the neurovascular syndrome. The high percentage of neurological complication shows a symptom of Thoracic Outlet Syndrome.

Sharma D.K et al 2014(20), In All India Institute of Medical Sciences, Raipur, Chhattisgarh, conducted studies on 5000 cervical spine and chest X-rays. They have found 61 cases of cervical ribs presence. The prevalence of cervical ribs, in general, for Indian population is less than 1%.

Venkatesan Vathsala et al 2014(21) carried out a study on 1500 chest & cervical spine X-rays in Vathsala Venkatesan Shree Balaji Medical College & Hospital Chennai. They found 22 cases (20 Unilateral and 2 Bilateral). The reported incidence of cervical rib by them is around be 1.16%.

Abimbola O Ebeye et al 2014(22) studied 500 chest & cervical spine X-rays in college of health sciences delta state, Abraka, Nigeria. They have found 3 cervical ribs cases with symptoms of neurovascular compromise due to compression of the neurovascular bundle.

P. Vinodhini et al 2013(23), in Kasturba Medical College Manipal University, Manipal Karnataka, have reported a case of right cervical ribs in a 30 year old women with complain of swelling along the arms, pain due to possible neurovascular compression at the thoracic inlet & beyond into upper extremity.

Chang Zou Kevin et al 2013(24), in Johns Hopkins Medical Institutions, New York, United States, have examined 23 cervical rib patients (16 females and 4 males), as well as 3 individual who had subclavian vein thrombosis two weeks after their surgeries. Out of 3, two patients had balloon dilatation for stenosis.

Gupta Antima et al 2012(25), in Era Medical College Lucknow, Uttar Pradesh, have conducted a study on 12950 chest X-rays(7272 males & 5678 females) for cervical ribs presence. A total of 78 cases of cervical ribs were found (36 males and 42 females). Around 0.6% prevalence is reported in this study as compared to the London population showing an overall incidence of 0.74%.

Bokhari F Rakan et al 2012(26), in King Abdulaziz University & Hospital Jeddah, Saudi Arabia, have conducted a study on 1000 chest and cervical spine X-rays (490 males & 510 females). They found 128 cervical ribs cases which is around in 3.4% of analyzed population. Prevalence of cervical ribs and transverse process in this population is higher than that reported in other population.

Tryfonidis M. et al 2010(27) have compared the incidence of cervical ribs between white British and Asian population. The study was carried out in 1545 chest and cervical spine X-rays. Around 5.9% cases of white british & 24.9% cases of asian population were found. Clinical assessment of patients with symptoms of thoracic outlet syndrome was reported.

Brewin James et al 2009(28) in Guy's King's & St. Thomas school of Biomedical Sciences London, United Kingdom conducted a study on 352 radiographs. 10 cervical ribs has been found prevalence of cervical ribs 0.74% with higher rate of female compared to males (1.09% & 0.42%). The presence of elongated C7 transverse process was also reported.

Sanders J. Richard et al 2002(29) in University of Colarado Health Science Center & Rose Medical Center Denver Co., U.S.A. have carried out a study on more than 1000 chest and cervical spine X-rays for neurogenic thoracic outlet syndrome. 32 cervical ribs cases were found.

Since very few studies has been done on incidence of cervical ribs in population of Uttar Pradesh, hence the present study has been undertaken on population of Uttar Pradesh. The findings of the study would be compared with existing studies available from other state as well as different population group of the world.

AIM

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OBJECTIVES

AIM:- **I**ncidence of cervical ribs in Uttar Pradesh population.

OBJECTIVE:

- To Study radiographs for the presence of cervical ribs.
- To find out sexual dimorphism with respect to the occurrence of cervical ribs.
- To find out if it is unilateral or bilateral
- To compare the incidence with studies in other population groups.

MATERIAL AND METHODS

This study was conducted in the department of anatomy IIMS&R Integral University Lucknow (U.P), after obtaining permission from Institutional research committee and ethical committee.

This study was conducted on 1082 cervical spine and chest X-rays for the presence of cervical ribs.

X-Ray films were collected from Radio Diagnosis Department of IIMS&R Integral University-Lucknow (U.P), Radio Diagnosis Department of National Capital Region Institute of Medical Sciences Meerut (U.P) and Ved Diagnostic Centre – Jaunpur (U.P).

Each chest X-ray was placed on x-ray viewer to assess the presence or absence of cervical ribs (Fig.1).

The cervical ribs is attached to seventh cervical spine projected horizontally unlike the transverse process of the first thoracic vertebra which extends diagonally upwards from its point of origin.

A well-developed cervical rib must be separate but articulate with the transverse process of seventh cervical spine. If it is fused with the vertebra and longer than the first thoracic spine transverse process, it is classified as poorly developed or incomplete cervical ribs.

It has no connection with the manubrium sterni although it may form a bony fusion with the first rib thus distinguishing a cervical rib from rudimentary first rib.

The data will be tabulated and statistically analyzed.

INCLUSION CRITERIA

- Radiographs of Cervical spine and chest X-rays
- Radiogrphs of subjects belonging to Uttar Pradesh population.
- Radiographs of subjects who are 25 years or more.

EXCLUSION CRITERIA

- Poor quality X-rays where ribs were not clearly visible.

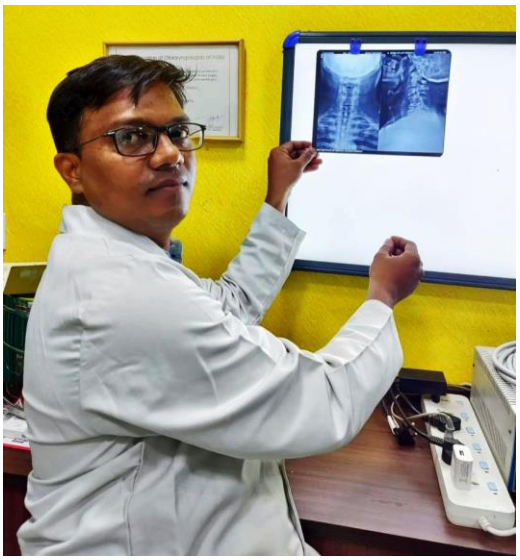

Fig – 1- Evaluation of X – Ray film

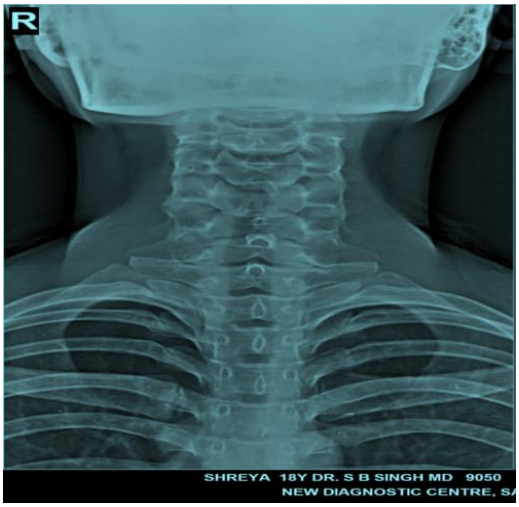

Fig – 2 Normal X – Ray of Cervical spine (AP View)

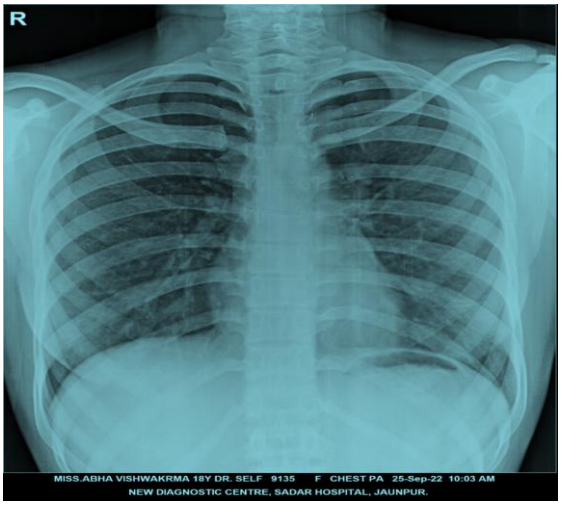

Fig – 3 Normal X – Ray of Chest (PA view)

OBSERVATION

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RESULTS

Table-1: Incidence of Cervical ribs:-

	Male (%)	Female (%)	Total (%)
X-Rays Studied	438 (40.48)	644 (59.52)	1082
Presence of Cervical ribs	3 (0.68)	7(1.08)	10 (0.92)
Bilateral Cervical ribs	Nil	1(10)	1
Unilateral Right side	3(0.68)	4 (57.14)	7
Unilateral Left side	Nil	2 (28.58)	2

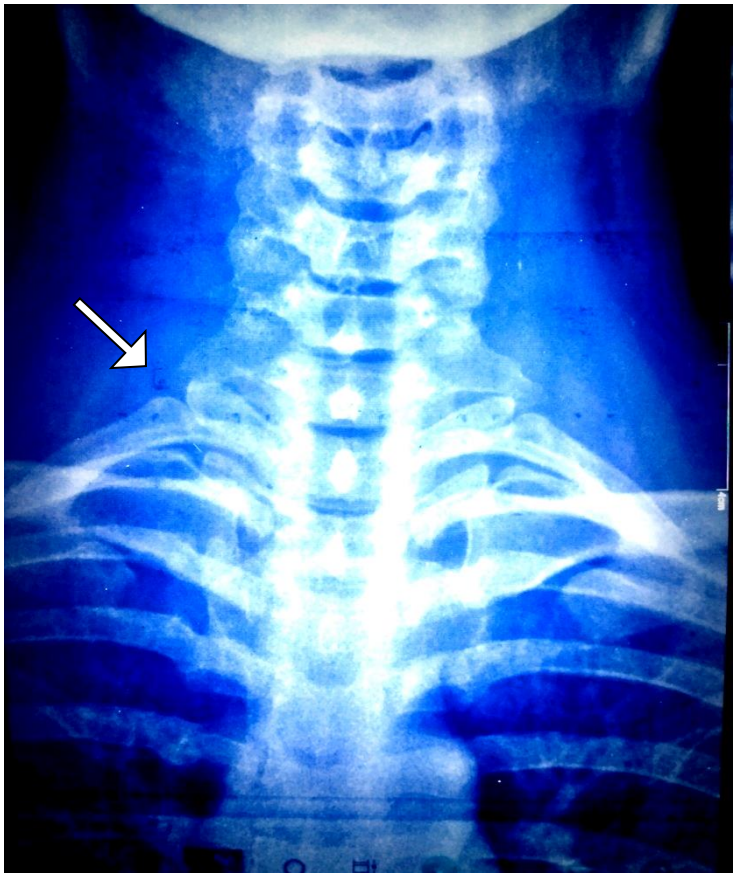

Fig. 6 – X-ray cervical spine with right side cervical ribs

Fig. 7 – X-ray chest with left side cervical ribs

Fig. 8 – X-ray cervical spine with bilateral cervical ribs

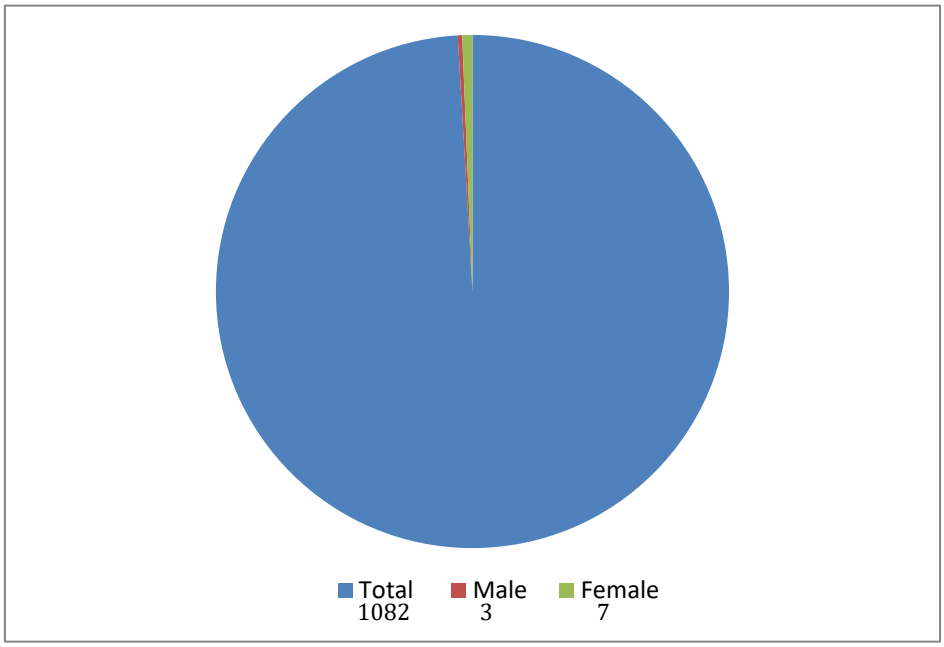

Fig. 4: Incidence of cervical ribs

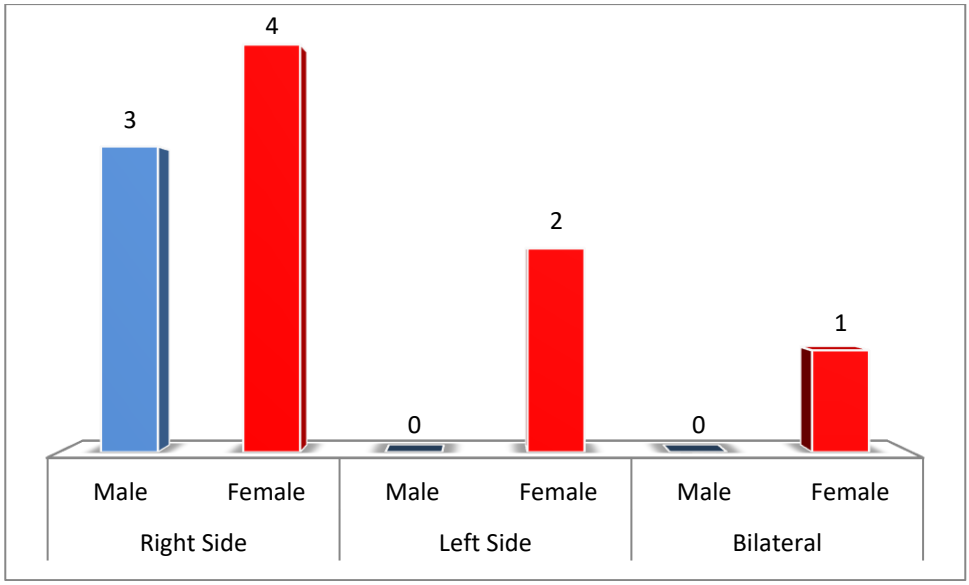

Fig. 5: Incidence of cervical ribs in male and female.(Comparative)

This cross-sectional study shows that among total 1082 Cervical spine and Chest X-rays, 10 (0.92%) cases of cervical ribs presence were diagnosed.

Among 644 (59.52%) females cases, 7 (1.08%) cervical ribs cases were diagnosed which include: 1 (10%) bilateral, 4 (57.14%) unilateral right side and 2 (28.58%) unilateral left side.

Out of 438 (40.48%) male cases, 3 (0.68%) cervical ribs cases of unilateral right side only were diagnosed.

Only one (1) patient with bilateral cervical ribs was found out of 10 cervical ribs cases. Unilateral cervical ribs on right side were identified in 7 (70%) patients and unilateral cervical ribs on left side were identified in 2 (20%) patients' only. Therefore, this study indicates that the overall incidences of unilateral right side cervical ribs were more pronounced than the unilateral cervical ribs of left side.

DISCUSSION

Table-2: Incidence of Cervical ribs in Indian Population:-

Region	Author	Year	Percentage
Lucknow (U.P)	Antima Gupta et al	2012	0.60%
Raipur (Chattisgarh)	D.K Sharma et al	2014	1.22%
Pune (Maharashtra)	M.G Savgaonkar et al	2006	0.60%
Kashmir (J &K)	Mudassir Hamid Bhatt et al	2015	2.67%
Guwahati (Assam)	Sushant Agarwal et al	2018	0.79%
Chennai (Tamilnadu)	Vathsala Venkatesan et al	2014	1.16%
Chennai (Tamilnadu)	Mallikarjun Ningappa Adibatti et al	2022	1.38%
Uttar Pradesh	Present Study	2022	0.92%

Table-3: Incidence Cervical ribs in different population of the world:-

Region / Country	Author	Year	Percentage
Malawian (East Africa)	L.E. Ebite et al	2007	0.58%
Urhobo (Nigeria)	E.O Abimbola et al	2014	0.60%
Nigerian	C.C. Ani et al	2012	0.65%
London	J. Brewin et al	2009	0.74%
American	M.J. Walden et al	2013	1.2%
White American	V.G Viertel et al	2012	1.3%
Anatolian (Turkey)	I.N Gluekon et al	1999	3.0%
Saudi Arabian	R.F Bokhari et al	2012	3.4%
Turkish	E.Erken et al	2002	6.2%
Nepal	S Lalchand et al	2016	1.1%
Pakistan (Khyber Pakhtunkhwa)	Shazia Iftikhar et al	2020	0.38%

In the second century, while dissecting human cadavers “Galen” discovered the cervical rib for the first time. Cooper was the first to note the clinical features of cervical rib induced neurovascular compression. The seventh cervical vertebra is home to the abnormal or additional rib known as the cervical rib, which may only be an epiphysis on the transverse process. Cervical rib incidence can be unilateral or bilateral, more common in female on right side.(15).

The paraxial mesoderm gives rise to the skeletal system. On either side of neural tube , somites are produced by the mesoderm cell. The cells of the Sclerotome transform into mesenchymal cells and finally into ribs towards the conclusion of the fourth week of development. The evolution of the cervical rib in the ancestor of mammals is likely related to the Hox genes” that are responsible for patterning of the axial skeleton and mutation within them. The remaining portion of the transverse process is united with these small primitive ribs. (15)

To study the incidence of cervical ribs, a total of 1082 cervical spine and chest radiographs were studied which include 644 (59.52%) female and 438 (40.48%) males. Out 1082 cases, 10 cases (around 0.92%) of cervical ribs were found which are less than 1% of the total studied cases. This study shows that the incidence of cervical ribs is more prominent in females as compared to male cases.

Out of 10 cases, bilateral cervical ribs are seen only in 1 (10%) case. The incidences of unilateral cervical ribs are more common. Its presence on right side was seen in 7 cases (around 70%) and on the left side in 2 cases (around 20%). This study shows that overall incidence of unilateral cervical ribs is more common than bilateral ribs.

The Comparison of previous Indian Studies (Table-2) have shown that the highest prevalence (around 2.67%) was reported among the Kashmiri population (Mudassir Hamid Bhatt et al.,2015) and lowest (around 0.6%) in Uttar Pradesh (Antima Gupta et al.,2012) and Maharastra (Savgaonkar M.G et al.2006). In Tamilnadu population, it is reported around 1.38% (Mallikarjun Ningappa Adibatti et al.,2022) and 1.16% (Vathasala Venkatesan et al.2014). In Chhatishgarh study, the incidence is reported around 1.22% (D.K Sharma et al). In assam population, the incidence of cervical ribs is reported around 0.79% (Sushant Agarwal et al.2018).

The Comparison of previous Foreign Studies have shown that the highest prevalence (6.2%) was reported in Turkish population (E. Erken et al, 2002), second highest (3.4%) in Saudi Arabian Population (R.F Bokhari et al., 2012) and then Anatolian (Turkey) population (around 3%, I.N Gluekon et al., 1999). The incidence of cervical ribs in White American population is around 1.2% to 1.3% (V.G Viertel et al.,2012 and M.J Walden et al.,2013). Nepalese population has around 1.1% cervical ribs prevalence (S. Lalchand et al.,20`16).

The lowest prevalence (around 0.38%) of cervical ribs was reported in Pakistan (Khyber Pakhtunkhwa) Population (Shazia Iftikhar et al.,2020), second lowest (around 0.58%) in Malawian Southeastern Africa population (L.E Ebite et al.,2007). Around 0.60-0.65% cervoical ribs prevalence is reported in Nigeria population (E.M Abimbola et al.,2014, C.C Ani et al.,2012). In London population, the prevalence of cervical ribs is around 0.74% (J. Brewin et al.,2009).

In this study, the incidence of cervical ribs is found around 0.92% which is very similar to the Indian and foreign studies (Tables-2 and 3).

In most of the Indian and foreign studies, the prevalence of female cervical ribs have been reported more in male population. Our study also corroborates with similar prevalence of female cervical ribs as reported in different studies (Table-2 and 3). Some studies (Vathsala Venktesan et al. 2014, and D.K Sharma et al.2014) have reported Male cervical ribs prevalence.

The presence of right side unilateral cervical ribs were reported prominently by most of the authors (Table-2 and 3) as compared to the left side unilateral ribs. This study also shows similar prevalence of the unilateral right side cervical ribs. The presence of bilateral cervical ribs is not very common. However, some of the Indian studies have reported the presence of bilateral cervical ribs higher than the unilateral cervical ribs (Antima Gupta et al. 2012, D.K Sharma et al,2014 , Sushant Aharwal et al.2018).

CONCLUSION

- The frequency of cervical ribs presence is around 0.92% with female predominance.

- Unilateral right side cervical ribs are common as compared to the left side cervical ribs.

- In patients presenting symptoms of upper limb Ischemia and Paresthesia. The presence of cervical ribs should be ruled out. Although, the incidence is less than 1%.

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इंटीग्रल इंस्टिट्यूट ऑफ़ मेडिकल साइंसेज एंड रिसर्च
इंटीग्रल यूनिवर्सिटी लखनऊ - 226026
सूचित सहमति पत्र

मरीज का नाम……दूरभाष संख्या……
शोध / अध्यन का विषय……...
मरीज / व्यक्ति का पूरा नाम / पता……
जन्मतिथि /आयु……

मैं यह घोषणा करता/करती हूँ कि मैंने इस सहमति पत्र को पढ़ लिया है। पढ़ कर सुना दिया गया है। मेरी अपनी भाषा मे मुझ पर किए जाने वाले शोध अध्ययन और परीक्षण के बारे में भली भांति समझा दिया गया है तथा इस विषय में किसी प्रकार की जानकारी प्राप्त करने / प्रश्न करने का पूर्ण अवसर प्रदान किया गया है। मैं भली भांति अवगत हूँ कि इस शोध / अध्ययन में भाग लेना अथवा नहीं लेना पूर्ण रूप से स्वैशिक है तथा किसी भी समय बिना कोई कारण बताये अध्ययन से अपनी चिकित्सकीय देखभाल अथवा वैधानिक अधिकारों को प्रभावित न होते हुए अलग हो सकता हूँ।
यह भी भली भांति समझता समझती हूँ कि इस शोध / अध्ययन को करने वाले अध्ययन की कराने वाले इथिक्स कमेटी अथवा अन्य नियामक संस्थान / संस्थाओं को मेरी सहमति के बगैर मेरी स्वास्थ्य संबंधी अभिलेख, वर्तमान अध्ययनों तथा आगामी अन्य रिसर्च में उपयोग किया जाएगा। मैं यह भी समझता /समझती हूँ कि मेरी पहचान तथा अन्य सूचनाएँ किसी तृतीय पक्ष से साझा नहीं की जाएगी या प्रकाशित नहीं किया जाएगा।
मेरे शोध अध्ययन से विरत होने की दशा में, मैं अपने से संबंधित समस्त आंकड़े नतीजे जो इस शोध अध्ययन से प्राप्त होंगे उसका उपयोग केवल वैज्ञानिक प्रकाशन हेतु सहमति प्रदान करता /करती हूँ। मैं अपने रेडिओग्राफस के संग्रहीत एवं संरक्षित नमूनों को भविष्य में किए जाने वाले अनुसंधानों में उपयोग किए जाने की सहमति प्रदान करता/करती हूँ।
मुझे बताया गया है कि किसी भी प्रकार के परीक्षण के लिए मुझे कोई भुगतान नहीं करना होगा। सभी भुगतान अध्ययनकर्ता द्वारा किया जाएगा।
मुझे बताया गया है कि परीक्षण के दौरान होने वाली किसी भी आकस्मिक जटिलता उत्पन्न होने की दशा में समस्त सहायता श्री/सुश्री…….....दूरभाष संख्या……....द्वारा उपलब्ध कराया जाएगा। मुझे बताया गया है कि अध्ययन में सम्मिलित होने के लिए समस्त सावधानी बरतते हुए रेडिओग्राफस लिया जाएगा। उक्त प्रकार के नमूना संग्रह / जांच इत्यादि से होने वाली जटिलताओं जैसे .....
.....को मुझे भली भांति समझा दिया गया है।

मरीज / व्यक्ति के अंगूठे का निशान / हस्ताक्षर.....

व्यक्ति का नाम……..दिनांक.....

अध्ययनकर्ता के हस्ताक्षर.....दिनांक .....

अध्ययनकर्ता का नाम……..

गवाह के हस्ताक्षर……....दिनांक .....

गवाह का नाम…….

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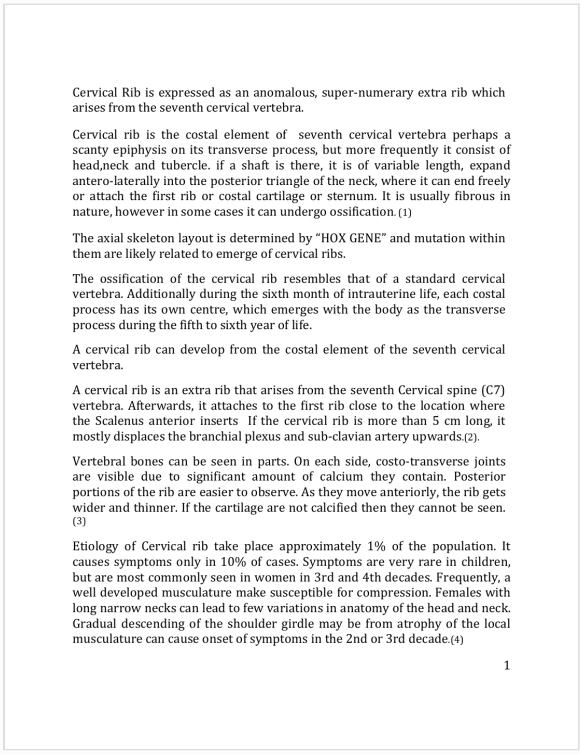

Cervical Rib is expressed as an anomalous, super-numerary extra rib which arises from the seventh cervical vertebra.

Cervical rib is the costal element of seventh cervical vertebra perhaps a scanty epiphysis on its transverse process, but more frequently it consist of head,neck and tubercle. if a shaft is there, it is of variable length, expand antero-laterally into the posterior triangle of the neck, where it can end freely or attach the first rib or costal cartilage or sternum. It is usually fibrous in nature, however in some cases it can undergo ossification. (1)

The axial skeleton layout is determined by "HOX GENE" and mutation within them are likely related to emerge of cervical ribs.

The ossification of the cervical rib resembles that of a standard cervical vertebra. Additionally during the sixth month of intrauterine life, each costal process has its own centre, which emerges with the body as the transverse process during the fifth to sixth year of life.

A cervical rib can develop from the costal element of the seventh cervical vertebra.

A cervical rib is an extra rib that arises from the seventh Cervical spine (C7) vertebra. Afterwards, it attaches to the first rib close to the location where the Scalenus anterior inserts If the cervical rib is more than 5 cm long, it mostly displaces the branchial plexus and sub-clavian artery upwards.(2).

Vertebral bones can be seen in parts. On each side, costo-transverse joints are visible due to significant amount of calcium they contain. Posterior portions of the rib are easier to observe. As they move anteriorly, the rib gets wider and thinner. If the cartilage are not calcified then they cannot be seen. (3)

Etiology of Cervical rib take place approximately 1% of the population. It causes symptoms only in 10% of cases. Symptoms are very rare in children, but are most commonly seen in women in 3rd and 4th decades. Frequently, a well developed musculature make susceptible for compression. Females with long narrow necks can lead to few variations in anatomy of the head and neck. Gradual descending of the shoulder girdle may be from atrophy of the local musculature can cause onset of symptoms in the 2nd or 3rd decade.(4)

1

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