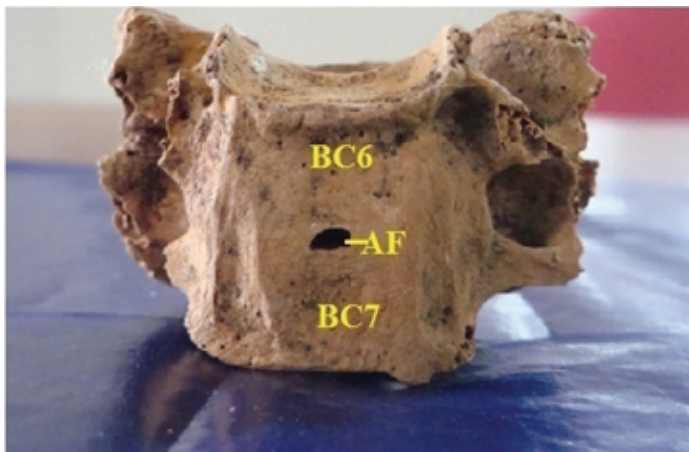


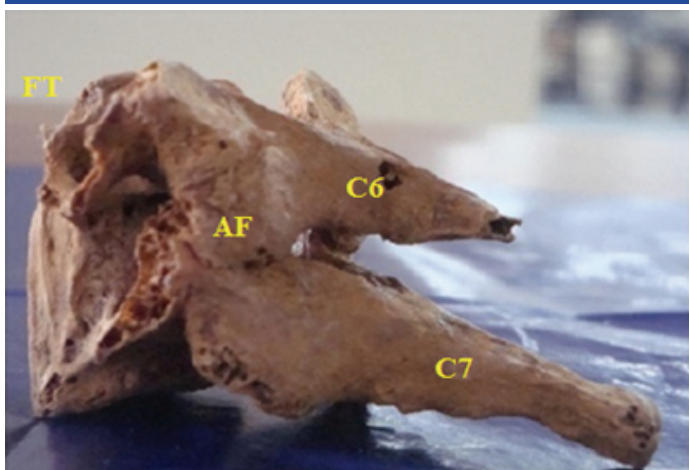
Congenital Fusion of C6 and C7 Vertebra—A Case Report

VANITHA¹, CHANDRIKA TELI², H. S. KADLIMATTI³**Keywords:** Cervical vertebrae, Compression, Vertebral development

During osteology demonstration classes for 1st year MBBS medical students fused cervical sixth and seventh vertebra were found having completely fused bodies [Table/Fig-1]. However, the bodies were partially fused posteriorly leaving a small gap on left side. Superior surface of sixth cervical vertebrae had uncal process for inferior surface of body of fifth vertebra. Inferior surface of seventh cervical Inferior surface of seventh cervical vertebra was flat. Pedicle, laminae and foramina transversarium were not fused on both the sides, Intervertebral foramina were patent. The inferior articular facet of C6 and superior articular facet of C7 were partially fused [Table/Fig-2].



[Table/Fig-1]: Shows fusion of body of sixth and seventh vertebra. BC-6 body of sixth vertebra, BC7-body of seventh vertebra. AF-Anterior foramen



[Table/Fig-2]: Shows partially fused articular facets [AF], Spines C6 and C7 vertebra, Foramina transversarium [FT]

DISCUSSION

In Fused cervical vertebrae, the fusion may be either congenital or acquired [1]. Congenital fusion of cervical vertebrae (CFCV) is one of primary malformations of chorda dorsalis [2]. The most important differential diagnosis in CFCV is decreased AP diameter of the vertebra and individual measurements of the two vertebral bodies' height are equal to the two fused vertebrae's height including the intervertebral disc [1]. Diseases like tuberculosis, juvenile rheumatoid

arthritis and trauma is generally associated with acquired FCV [1]. In this case vertebral bodies were normal. We didn't observe any degenerative in the vertebrae, suggesting it might be congenital.

Common site of fusion of cervical vertebrae is at C2-C3 with an incidence of 0.4% to 0.7% with no sex predilection [3]. According to the frequency of block vertebrae, the order is C2-C3, C5-C6, L4-L5 and any segment of thoracic spine block vertebrae [3].

Vertebral column starts developing during 3rd week with segmentation of paraxial mesoderm forming somites. Failure of normal segmentation of embryological spines may lead to fused vertebrae or block vertebrae [4]. Disturbance of PAX-1 gene expression may lead to vertebral fusion anomalies [5].

Although, FCV may be silent; in advanced age it causes degenerative changes in non segmented cervical regions and secondarily, it leads to hyper mobility and degenerative arthritis above and below the fused cervical region [6,7]. Defects in development of occipital and cervical somites and effect of environment, genetic factors during 3rd week of conception may lead to such fusion of vertebra [8,9]. Fusion of cervical vertebrae may cause shortening of cervical spine, lateral prominence of trapezius gives webbed appearance of neck, limited neck motion, lowered hair line, osseous malformation (scoliosis, kyphosis and torticollis) may lead to signs of peripheral nerve irritation such as pain, burning sensations and cramp or signs of nerve compression such as hypoaesthesia/anaesthesia, weakness/paralysis, fibrillations and reduced deep reflexes [10].

Awareness of these anomalies may reduce anaesthetic risk during intubation with neck extension [11]. [Table/Fig-3] shows reported cases of fusion of cervical vertebrae in different population. Early diagnosis of these anomalies can help in progression of degenerative process by motivating the patient to change their life style like avoiding undue trauma, extension and rotational maneuvers which may place the spinal cord and vertebral artery at risk [3].

AUTHOR	YEAR	FUSED CERVICAL VERTEBRAE	CASE REPORTED	POPULATION
Tiwari et al., [10]	2002	Typical	1	Indian (Noida)
Erdil et al., [1]	2003	C5-6	1	Turkey
		C1-2 & C6-7	1	
		C4-5 & C6-7	1	
		C4-5-6	1	
		C6-7	1	
Wazir et al., [12]	2011	C2-3	1	Indian (Amritsar)
SS Imran and Pujari Dinanath [13]	2012	Typical	2	Indian (Gulbarga)
Present	2015	C6-7	1	Indian (Gulbarga)

[Table/Fig-3]: Shows reported cases of fusion of cervical vertebrae in different population

Fusion of C6 and C7 restricts the movements of the neck and may also compress the nerves. Knowledge of such anomalies is important for anaesthesiologists during intubation and also for orthopaedicians, neurosurgeons and surgeons during surgeries of the neck.

REFERENCES

- [1] Erdil H, Yildiz N, Cimen M Congenital Fusion of Cervical Vertebrae and Its clinical significance. *Journal of Anatomical Society of India*. 2003;52(2):125-27.
- [2] Besnick D, Niwayama G. Diagnosis of bone and joint disorders, 2nd Edn, Volume No. 5. W.B. Saunders company, 1985. Pp. 1081-83.
- [3] Soni P, Sharma V, Sengupta J. Cervical vertebral anomalies: Incidental findings on lateral Cephalogram. *Angle Orthodontist*. 2008;78:178-80.
- [4] Moore KL, Persaud TVN. The skeletal system; The developing Human: clinically oriented Embryology. 8th edition 2008. Pp. 339, 344.
- [5] David KM, Coop AJ, Stevens JM, Hayward RD, Crockard HA. Split cervical spinal cord with Klippel—Feil syndrome: seven cases. *Journal of Neurology*. 1996;119(6):1859-72.
- [6] Mc Rae DL, Barnum AS. Occipitalization of the atlas. *American Journal of Roentgenology*. 1953;70:23-46.
- [7] Yin HP, Yang KQ, Lou SQ. Clinical significance of congenital fusion of cervical vertebrae: case report of 87 cases. *Zhonghua Wai Ke Za Zhi*. 1989;27(2):75-77.
- [8] Dunsker SB, Brown O, Thompson N. Craniovertebral anomalies. *Journal of Clinical Neurosurgery*. 1980;27:430-33.
- [9] Sherekar SK, Yadav YR, Basoor AS, Baghel A, Adam N. Clinical implications of alignment of upper and lower cervical spine. *Neurol India*. 2006;54(3):264-67.
- [10] Tiwari A, Chandra N, Naresh M, Pandey A, Tiwari K. Congenital Abnormal Cervical Vertebrae- A Case Report. *Journal of Anatomical Society of India*. 2002;51:68-69.
- [11] Veena VS, Roopa KR. Block vertebra: A case report. *Int J Anatomical variations*. 2011;4:15-18.
- [12] Wazir S, Mahajan A. Fusion of axis with the third cervical vertebrae- a case report. *Indian Journal of Fundamental and Applied Life Sciences*. 2011;1(4):164-66.
- [13] Imran SS, Dinanath P, Uzair SH. Congenitally Fused Cervical Vertebrae. *Anatomica Karnataka*. 2012;6 (3):73-75.

PARTICULARS OF CONTRIBUTORS:

1. Tutor, Department of Anatomy, ESIC Medical College, Gulbarga, Karnataka, India.
2. Assistant Professor, Department of Anatomy, ESIC Medical College, Gulbarga, Karnataka, India.
3. Professor & Head, Department of Anatomy, ESIC Medical College, Gulbarga, Karnataka, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Vaniitha,
Tutor, Department of Anatomy, ESIC Medical College, Sedam Road, Gulbarga-585106, Karnataka, India.
E-mail: vanithasanjeev@gmail.com

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