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Research Article

Anatomical and Orthopaedic Perspective of a Block Cervical Vertebra Anatomic, Embryological and Orthopedic Perspective

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Abstract:
The vertebral column can have many anatomic defects. One of the rarer vertebral defect is the block vertebrae in which two adjacent vertebrae can be fused. This is a classic example of metamerism in human body. These two vertebrae appear as Anatomically one vertebrae. The fusion can be right from the birth or can be acquired defect. There may be associated Myelopathy, Muscular weakness, Klippel Feil Deformity, Rheumatoid arthritis, Tuberculosis, scoliosis or trauma, ankylosing spondylitis, diffuse idiopathic skeletal hyperostosis, fibrous dysplasias , rickets.

Key words: Spinal, Fusion, Block, Column, Segmentation.

Introduction:

The vertebral column can have many anatomic defects. One of the rarer vertebral defect is the block vertebrae in which two adjacent vertebrae can be fused. This is a classic example of metamerism in human body. These two vertebrae appear as Anatomically one vertebrae. The fusion can be right from the birth or can be acquired defect. There may be associated Myelopathy, Muscular weakness, Klippel Feil Deformity, Rheumatoid arthritis, Tuberculosis, scoliosis or trauma, ankylosing spondylitis, diffuse idiopathic skeletal hyperostosis, fibrous dysplasias , rickets.

Discussion:

The young patient presented with chronic pain in his cervical region. On Examination of the patient the range of neck movements was decreased . Flexion and extension were markedly decreased. However there was no muscular weakness of upper limbs, hypoesthesia or parasthesia. Neurological examination was normal.

Investigations revealed:

Temp: 98.6^0F

BP: 126/78

RR: 12/Min

Pulse 82 bpm

HB: 11.7 gm/dl

WBC : 7200 / microlitre

Platelets : 2,80,000/microlitre (n 150000-400,000)

Anti CCP antibody Positive

Sodium: 144meq/L (n 135-145)

Potassium : 4 meq/L(n 3.5-5)

CXR: Normal

MRI spine: Block Cervical Vertebrae.

The vertebral column can have many anatomic defects. One of the rarer vertebral defect is the block vertebrae in which two adjacent vertebrae can be fused. This is a classic example of metamerism in human body. These two vertebrae appear as Anatomically one vertebrae. The fusion can be right from the birth or can be acquired defect. There may be associated Myelopathy, Muscular weakness, Klippel Feil Deformity **1**, Rheumatoid arthritis, Tuberculosis, scoliosis , neurological defects **2** or trauma.

Normal Spinal Anatomy :

In the adult four distinct antero posterior curves are seen. Primary curves retain their original posterior convexity and are found in the thoracic and sacral regions . Secondary curves are convex anteriorly are found in cervical and lumbar regions**.3** The cervical curve appears when the infant holds its

head up after the third month. The lumbar curve develops when the child begins to walk and holds his trunk upright. In the adult male , the average length of the vertebral column is about 28 inches ,but in adult female is about 24 inches. Cervical Vertebrae are seven in number . There is a foramen in the transverse process called foramen transversarium and the vertebral artery passes through Ci-C6 but not that of C7. C1 has no body and it is fused with C2 and is called as odontoid process. The spine of C7 is the longest and is called vertebra prominens. C1, C2, C7 are atypical and the rest are typical**.4**

Development of a typical vertebra

The vertebral column is formed from the Sclerotomes of the somites and the cells of the sclerotome become converted into loose mesenchyme.This mesenchyme migrates medially and surrounds the Notochord.The mesenchyme then extends back on either side of the neural tube and surrounds it.

The extensions of this mesenchyme also take place laterally in the position to be occupied by the transverse processes and ventrally in the body wall, in the position to be occupied by the ribs.

The mesenchyme derived from each somite is seen as a distinct segment and the cells are distributed uniformly.Then the cells soon become condensed in a region that runs transversely across the middle of the segment and this is called perichordal disc.Above and below it there are less condensed parts. **5** The mesenchymal basis of the body (centrum) of each vertebra is formed by fusion of the adjoining , less denser parts of two segments.The perichordal disc becomes the inter-vertebral disc.The neural arch , the transverse processes and the costal elements are formed in the same way as body.The inter-spinous and inter transverse ligaments are formed like the inter -vertebral disc. The notochord disappears in the region of the vertebral bodies, but in the region of the inter-vertebral discs it becomes expanded to form nucleus pulposus. Hence, vertebrae are inter-segmental. The spinal nerves are segmental, therefore they emerge between the two adjacent vertebrae and lie between two adjacent ribs**.6, 7**

The blood vessels supplying structures derived from myotome like intercostals vessels are inter segmental like the vertebrae. Embryological failure of normal spinal segmentation is a cause of congenital cervical block vertebrae and can be seen as early as 3rd to eighth week of intrauterine life.

Conclusion:

As the Block vertebrae are associated with a number of other clinical conditions a thorough look for associated Myelopathy, Muscular weakness, Klippel Feil Deformity, Rheumatoid arthritis, Tuberculosis, scoliosis or trauma, ankylosing spondylitis, diffuse idiopathic skeletal hyperostosis, fibrous dysplasias , rickets should be made. This clinical condition should be looked for as Premature degeneration, biomechanical stress, discal tear , spondylisis can occur as a complication.

Fig: Demonstrating a Block Cervical Vertebrae

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