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Letter to the Editor

Incidental findings of C1, C2 and C3 fused vertebrae

Dear Sir,

Awareness of the presence or absence of skeletal abnormalities of spine are of interest not only to the researchers but also to the clinicians as these anomalies may result in pain, decreased mobility, muscular weakness of limbs and sensory deficits [1–3] can alter the planning the operative and medical approach to the patient.[2] A 30-year male patient presented with history of road traffic accident 6 hours duration. There was no history of loss of consciousness, vomiting, ENT bleeding or convulsion. He sustained multiple lacerations over face and left forearm. The patient was conscious, alert and oriented. There were no focal neurological deficits. His general and systemic examination was unremarkable. The patient underwent cervical spine X-ray as a part trauma investigation protocol. X-ray cervical spine lateral view showed C1 and C2 fused completely including fusion of intervertebral disc space and posterior elements. In addition there was evidence of fusion of C2 and C3 laminae and associated degenerative changes at C3 and C4 level (Fig. 1). There was no restriction of neck movements.

Klippel-Feil syndrome (KFS) is characterized by congenital fusion of two or more cervical vertebrae.[4–10] During embryonic development and by day 20, the subdivision of the paraxial mesoderm into hemimetameric block-like masses (the somites) starts and it continues cephalocaudally until day 30 of embryonic growth.[11,12] KFS occurs as a result of failure in normal segmentation of cervical mesodermal somites at second-eight weeks of gestation.[10,12,13] Although the exact cause is not know, however in certain cases due to impaired local blood supply there may be abnormal segmentation and formation of congenitally fused vertebrae or block vertebrae.[3] KFS can be classified into three types: (Type 1 – 40% cases) Fusion of cervical and upper thoracic vertebrae with synostosis, (Type II – 47% cases) Isolated cervical spine fusion, as in present case and (Type III – 13% cases) Cervical vertebrae with lower thoracic or upper vertebral fusion. Recently a new classification has been proposed: (Type I) single-level fusion, (Type II) multiple, noncontiguous fused segments and (Type III) multiple, contiguous fused segments.[14] Congenital fusion of vertebrae most commonly involves cervical region followed by lumbar and thoracic spine.[15] Congenital fusion of C1-C2 vertebrae is rarely described with only few case reports in literature.[13] Congenital block vertebrae may be associated with other systemic anomalies including scoliosis or kyphosis, Sprengel's deformity, hemivertebrae, platybasia, basilar impression, spina bifida, anomalies involving kidneys and the ribs, cleft palate, respiratory problems, deafness or hearing impairment, and cardiac anomalies.[13] Clinical evidence of the congenitally fused segments may not be apparent until there are signs and symptoms of neurological impairment.[4,8,16] The presence of block vertebrae can results in more biomechanical stress in the adjoining segments leading to degenerative changes, ligament rupture and intervertebral disc prolapse.[4,15–17] Once these anomalies are diagnosed (as in

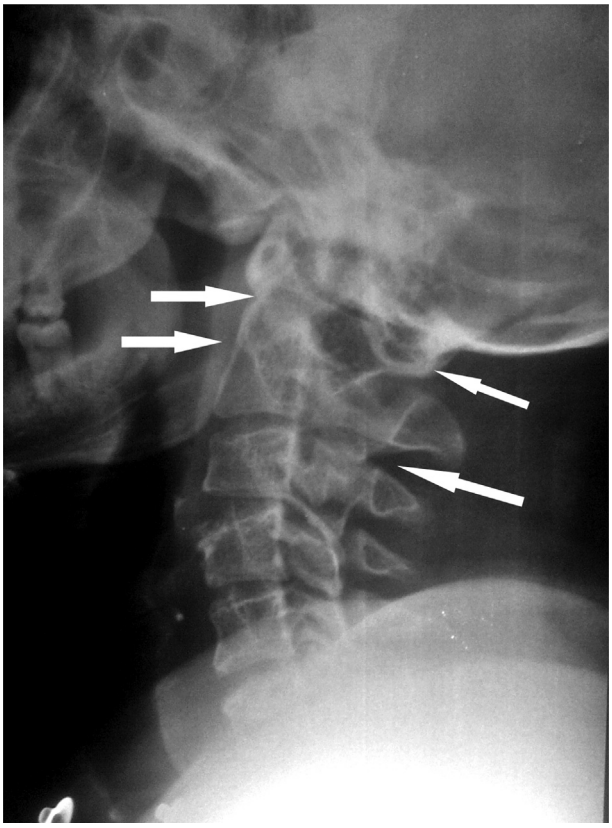

Fig. 1 – X-ray cervical spine showing almost complete fusion of C1 and C2 and fusion of laminae of C2 and C3 vertebrae (arrows). Please note the reduced space between C1 and skull base and degenerative changes at C3-4 level

present case) the patient can be motivated to change their lifestyles to avoid an injury and thus to avoid progression of a degenerative process and also motivates the patient to lead a normal life.[18] For the clinician if patient need endotracheal intubation, there will be a need to take care to prevent hyperextension as it can precipitate disc prolapse.[3]

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