Role of three –dimensional computed tomography imaging in Eagle's syndrome

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Citation

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Abstract

Eagle's syndrome is an aggregate of symptoms caused by an elongated ossified styloid process and or calcified stylohyoid ligament. This is a rare finding that often goes undetected in absence of radiographic evaluation. Eagle's syndrome can occur unilaterally or bilaterally with the most common symptoms of dysphasia, headache, craniofacial or cervical pain, foreign body sensation in the pharynx ,change in voice and a sensation of hypersalivation.

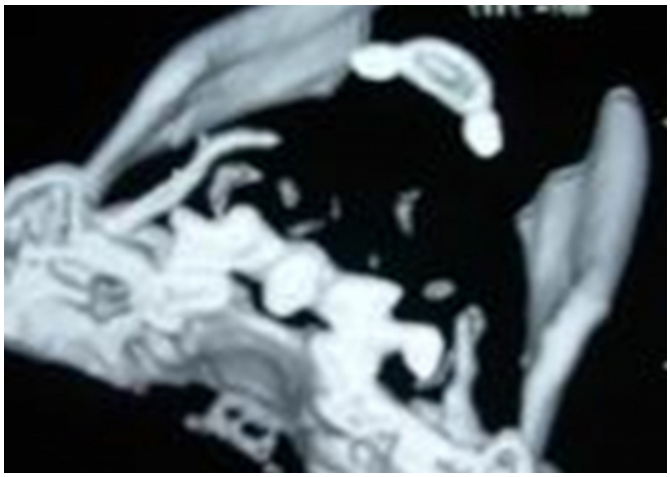
CASE HISTORY

Two cases with symptoms of dysphagia with intermittent facial pain for more than one year. Clinically, the patients were diagnosed as case of Eagle's syndrome and were referred to the radiology department for three-dimensional computed tomography (3D-CT) imaging to evaluate the styloid processes in reference to length and direction.

In case one, a 40 year old woman underwent 3D-CT imaging using a single slice spiral scanner (Siemens AR star).The images were obtained in the coronal plane in prone position for styloid processes with slice thickness of 2mm and table increment of 1mm.The images were reconstructed in 1mm thickness. The other parameters chosen were 130KV and 83 mAs. Post processing of raw data was performed at the workstation terminal to get 3D-CT images using ‘surface shaded display” software. In this case the elongated Right styloid process measured 41.4mm and Left styloid process measured 30mm in their maximum length in coronal 3D-CT (Fig.1)

Figure 1

Figure 1: Oblique coronal 3D image shows elongated Rt styloid process



The second case was a 54 year old male patient who underwent 3D-CT imaging using multi-slice CT scanner(GE 16 light speed).The parameters used were helical,0.625mm slice thickness, pitch 0.562:1,interval 0.625mm,KV 120 and mA 250.The images were reconstructed in 3D mode using AW 4.2 workstation. This showed bilateral elongated styloid process measuring 53.1mm on Right and 41.3mm on Left(Fig.2,3,4).

Figure 2

Figure 2: Sagittal 3D projection showing elongated Rt styloid process

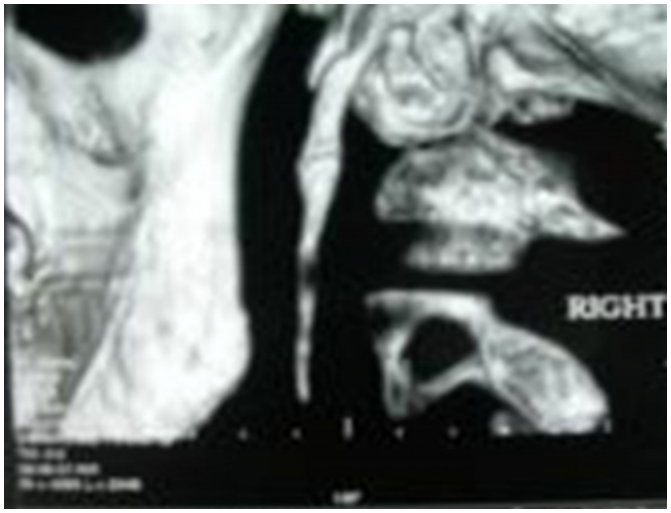


Figure 3

Figure 3: Sagittal 3D image shows elongated Lt styloid process

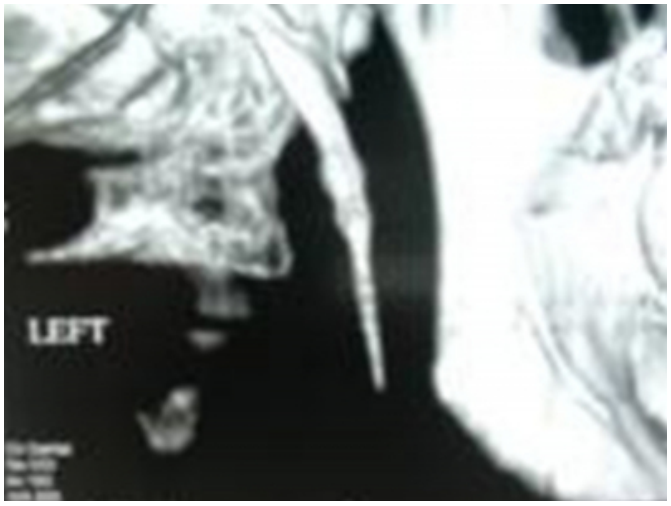
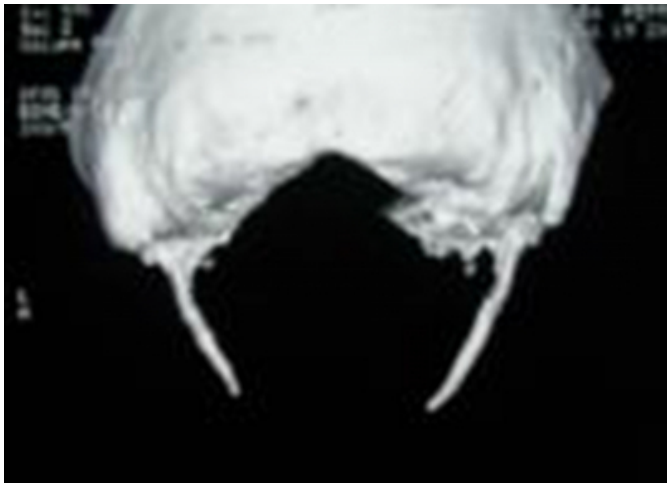


Figure 4

Figure 4:Coronal 3D image showing bilateral elongated styloid process



DISCUSSION

Approximately 4% of the population is thought to have an elongated styloid process but only small percentage (4% to 10.3%) of this group is thought to be symptomatic .The length of styloid process is variable .Kaufman et al. reported that 30mm is the upper limit for normal styloid process. In radiological studies, the length of an elongated styloid process is generally >30mm in length. The presence of elongated styloid process is not pathognomic for Eagle's syndrome, because many patients with incidental findings of an elongated styloid process are asymptomatic.

Several imaging modalities have been used for the diagnosis of Eagle's such as plain radiographs, panoramic radiographs, barium swallow and computed tomography. Computed tomography is useful as it provides complimentary information to that of plain radiographic studies. Despite the valuable information about the anatomy ,there are some difficulties in reading the plain radiographs secondary to superimposition of anatomical structures. Superimposition of several osseous structures and distortion and magnifications secondary to angulations are the potential disadvantages of the conventional radiographs and in particular panoramic films.

3D-CT images with spiral scanner eliminate all these drawbacks and provide all the information about the styloid process including its length, direction and anatomical relations ([1]).Another advantage of 3D-CT images is that it provides three dimensional length measurements, which are impossible in conventional 2D-CT images such as in coronal or axial planes. In cross sectional imaging ,even in coronal

plane, most of the time ,the images will not be parallel to the styloid processes particularly when they are angulated or deviated ,leading to underestimation of the actual length of the styloid process.

CONCLUSION

3D –CT is a valuable diagnostic imaging tool in patients with Eagle's syndrome which allows to evaluate accurately the styloid process in reference to length, direction and surrounding anatomical relations thus helping surgeons to tailor their surgical approach in patient's management. These above advantages make 3D-CT imaging superior to conventional imaging modalities.

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