Case Report
pISSN 1738-2637 / eISSN 2288-2928
J Korean Soc Radiol 2013;69(3):235-237
http://dx.doi.org/10.3348/jksr.2013.69.3.235

대한영상의학회지

Aberrant Articulation of Cervical Vertebral Transverse Process: An Uncommon Normal Variant and Review of the Literature[1]

경추 가로돌기의 이소성 교합: 흔하지 않은 정상 변이와 문헌 고찰[1]

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Aberrant articulation between two anterior tubercles is a rare congenital anomaly that should be considered for patients showing a bony projection anterior to the vertebral body on a lateral radiograph of the cervical spine. We present a case of an elongation of the anterior tubercles of the transverse processes of both the fifth and sixth cervical vertebrae. This finding is probably a form of supernumerary cervical rib developing at a level above the lowest cervical spine.

Index terms
Cervical Vertebra
Transverse Process
Normal Variant
Aberrant Articulation

Received May 7, 2013; **Accepted** July 3, 2013
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INTRODUCTION

Elongation of the anterior tubercle of the transverse process of the sixth cervical vertebra is a rare finding which was first identified and described by Lapayowker (1) in 1960. We hereby present a case of an uncommon normal variant demonstrated by radiographs and multidetector computed tomography (MDCT) with articulation of the anterior tubercles of the transverse processes of both the fifth and sixth cervical vertebrae. This is the third report in the English literature (2, 3). Recognition of this finding is important to differentiate from fracture fragments, osteophytes and other origins of tumors.

CASE REPORT

A 36-year-old male patient visited our emergency room presenting nuchal pain and the left arm radiating pain due to a car accident. He was driving and crushed on the dash-board. A review of systems was not remarkable. Physical examination did not reveal any neck masses or tender points. There was no evidence of muscular atrophy of the upper extremity, and the radial pulse was normal in intensity. A complete neurological examination did not reveal any local motors or sensory deficits. Initial radiographs of the cervical spine showed no evidence of bone fractures. However, the anteroposterior view of the cervical spine showed a uniform radiolucent line between the right lateral masses of the fifth and sixth cervical vertebrae (Fig. 1). In the lateral view of the cervical spine, an unusual anterior bony projection bridging between the fifth and sixth cervical vertebrae was noted (Fig. 2). Unlike a bridging osteophyte, this projection arose posterior to the anterior margins of the vertebral bodies from the region of the transverse process. A lateral view of the cervical spine confirmed the origin of the projection from the right transverse process of the fifth and sixth cervical vertebrae, and delineated the well-defined-margin and cortication of the intervening radiolucency, indicating formation of an articulation at the point of contact for the projections. MDCT of the cervical spine revealed the exact anatomy of this variant (Fig. 3).

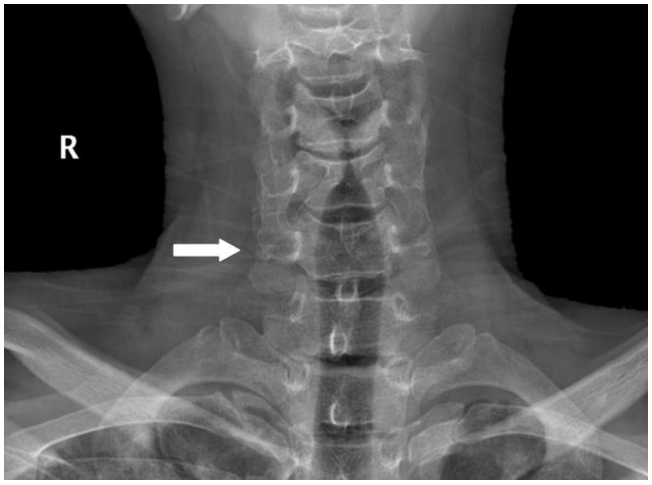

Fig. 1. Anteroposterior view of the cervical spine. There is a well-defined thin radiolucent gap between the lateral masses of C5 and C6 (arrow).

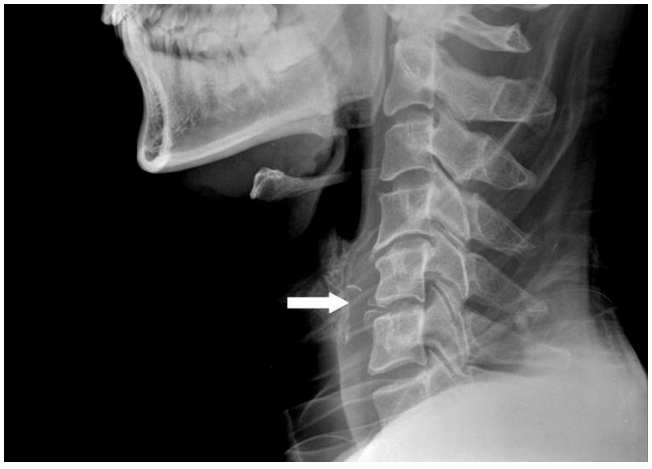

Fig. 2. Lateral view of the cervical spine. There is an anterior bony projection between C5 and C6. The bony mass arises posterior to the anterior margins of the vertebral bodies in the region of the transverse process (arrow).

A B

Fig. 3. CT scan of the cervical spine. The bony projections arose from the anterior tubercles of the right transverse processes (arrows). There is no evidence of bone fracture.
A. Axial scan at the level of C5.
B. Axial scan at the level of C6.

It demonstrated the origins of the bony projections from the right anterior tubercles of the fifth and sixth cervical vertebra. It was an incidental finding, since the radiographical findings did not correlate with the symptoms reported.

DISCUSSION

On anteroposterior radiography, a lateral mass overlapped the articular process, and the anterior and posterior tubercles were projected over one another, while from the lateral view, it was projected in part over the vertebral body. MDCT demonstrated that the bony projections seen on the lateral radiographs originated from the anterior tubercles of the transverse processes of the fifth and sixth cervical vertebrae. The origin of this variant is rooted in the embryologic developments of the vertebral columns in general, and particularly, the cervical vertebrae. The C3 through L5 vertebrae are similar in their patterns of development. Each vertebrae have three primary ossification centers: one centrum and two halves of the vertebral arches develop separately and must fuse to one another (4). The transverse processes of typical cervical vertebrae are pierced by the foramen transversarium. The transverse processes, with the tubercles of the ribs articulate formed by lateral extensions of the neural process centers, also extends ventrally to fuse with the centrums (2, 5). The anterior segment of the costal portion of the transverse process may develop from a separate center that appears in the cartilage on the sixth fetal month and is fused with the main ossification center of the transverse process by the sixth year (6). The anterior tubercle of the transverse processes of the cervical ribs is the homologue of the thoracic ribs, as opposed to the posterior portion of the transverse processes, and derives from the lateral ossification center (1). Therefore, elongation of the anterior tubercle of a cervical vertebral transverse process suggests another manifestation of a cervical vertebral costal component which develops to a greater than normal extent, and thus, is similar to a cervical rib (2). Aberrant articulation between the two anterior tubercles, such as is involved in the fifth and sixth cervical vertebrae in this case, has only been reported twice in the literature. It is a similar finding that occurs at the lumbosacral junction between the enlarged transverse process of a transitional fifth lumbar vertebra, and the ala of the sacrum (7).

In summary, the clinical importance of recognition for this

variant is in differentiating the anterior bony projections seen on the lateral view from a fractured fragment, the osteophytes, especially for patients with a history of cervical trauma.

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경추 가로돌기의 이소성 교합: 흔하지 않은 정상 변이와 문헌 고찰[1]

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두 개의 전방결절 사이의 이소성 교합은 드문 선천성 기형으로 경추 측면 사진에서 척추체 앞쪽으로 투영되는 뼈대가 보일 때 꼭 고려해 보아야 하는 감별진단이다. 우리는 제5번, 6번 경추 가로돌기에서 연장된 전방결절이 보였던 증례를 보고하고자 한다. 이러한 소견은 아마도 최하경추 위의 과잉경추늑골일 것으로 추정된다.

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