Neurochirurgie 63 (2017) 323–326

Disponible en ligne sur ScienceDirect www.sciencedirect.com

Elsevier Masson France EM|consulte www.em-consulte.com

Original article

Cervical pedicular agenesis: Case report and a review of the literature

F.-X. Ferracci[a,*], T. Dudoit[b], V. Gilard[a], A. Perez[a], F. Lucas[b]

[a] Department of Neurosurgery, Rouen University Hospital, Charles Nicolle, 1, rue de Germont, 76031 Rouen cedex, France
[b] Department of Neurosurgery, Caen University Hospital, 14033 Caen, France

ARTICLE INFO

Article history:
Received 3 January 2017
Received in revised form 18 March 2017
Accepted 21 April 2017
Available online 4 September 2017

Keywords:
Agenesis
Cervical spine
Pedicle
Diagnosis

ABSTRACT

Cervical pedicular agenesis, an unusual disorder, is a rare clinical and radiological finding, which can lead to misdiagnosis, moreover in a traumatic situation. The authors report the case of a young woman with a C3 right congenital absence of the cervical pedicle. A systematic review of literature found more than 70 reported cases. In patients with congenital agenesis of the cervical pedicle, the two most common levels of this congenital absence are C6 and C5. The three radiological findings were: the false appearance of an enlarged ipsilateral neural foramen due to the absent pedicle; a dysplastic, dorsally displaced ipsilateral articular pillar and lamina; and a dysplastic ipsilateral transverse process. These pedicle ageneses are a stable congenital anomaly.

1. Introduction

Cervical pedicular agenesis is a rare clinical and radiological finding. The first case was reported in 1946 by Hadley [1]. This congenital absence may produce a misdiagnosis, because the conditions of the main finding occurred in a traumatic situation [2]. The authors report the case of a woman with a C3 right congenital absence of the cervical pedicle.

2. Case report

2.1. Presentation

The authors report the case of an eighteen-year-old female, who presented to the emergency department with a cranial trauma due to a motorcycle accident. Initial observations were a few seconds loss of conscience. A rigid external cranial spinal immobilization was performed, until the body computed tomography (CT) was completed. Initial Glasgow outcome scale reached fifteen. Her vital signs were normal. The patient had neck pain with no focal deficit. Her previous medical history was uneventful and she had undergone oestroprogestative contraceptive treatment. She was admitted to the nearest trauma center for X-rays and a craniocervical CT scan.

2.2. Imaging feature

X-rays were performed with 3/4 acquisition (Fig. 1). These images clearly showed the absence of a pedicle between C2 and C3 right foramen. The craniocervical CT initially revealed a right acute subdural hematoma of less than 5 mm with no mass effect; and a right pedicular agenesis of the third cervical vertebrae. Based on this observation, an aspect of C2/C3 unilateral subluxation was shown on the CT scan (Fig. 2). A MRI was performed (Fig. 3), but did not show any disc ligament lesion on this cervical segment.

3. Review of literature

The authors carried-out a review of the literature on PubMed, using the following terms: “absent cervical pedicle” and “congenital cervical pedicle”. A total of 159 articles were selected. After analysis of the title and abstract, 22 articles concerning cervical pedicular agenesis were retrieved. The search was not restricted to articles in English and included all articles up to March 2017. For each case, data collected included:

- location of agenesis;
- age;
- gender;
- symptoms;
- diagnostic condition;
- management.

The data collected are shown in Table 1.

* Corresponding author.
E-mail address: francois-xavier.ferracci@neurochirurgie.fr (F.-X. Ferracci).

http://dx.doi.org/10.1016/j.neuchi.2017.04.003
0028-3770/

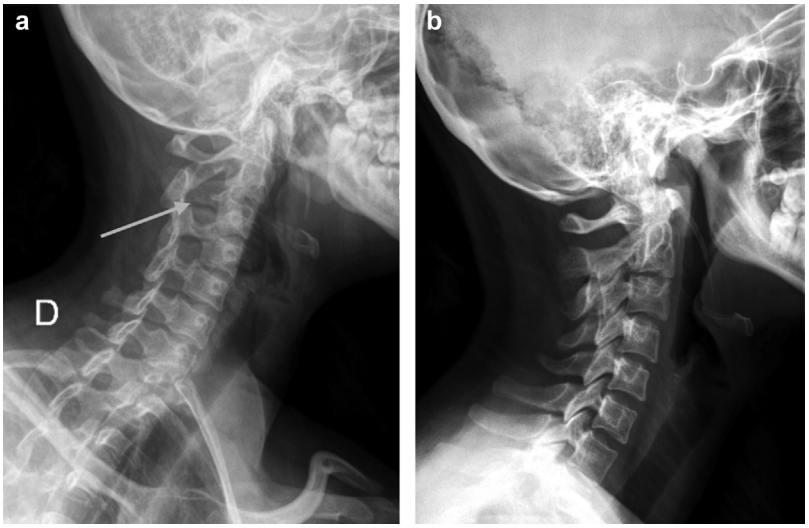

Fig. 1. a: these 3/4 right lateral X-rays clearly show the absence of C3 right pedicle. It also shows the enlarged ipsilateral neural foramen due to the absent pedicle; b: there is no facet dislocation on lateral X-rays.

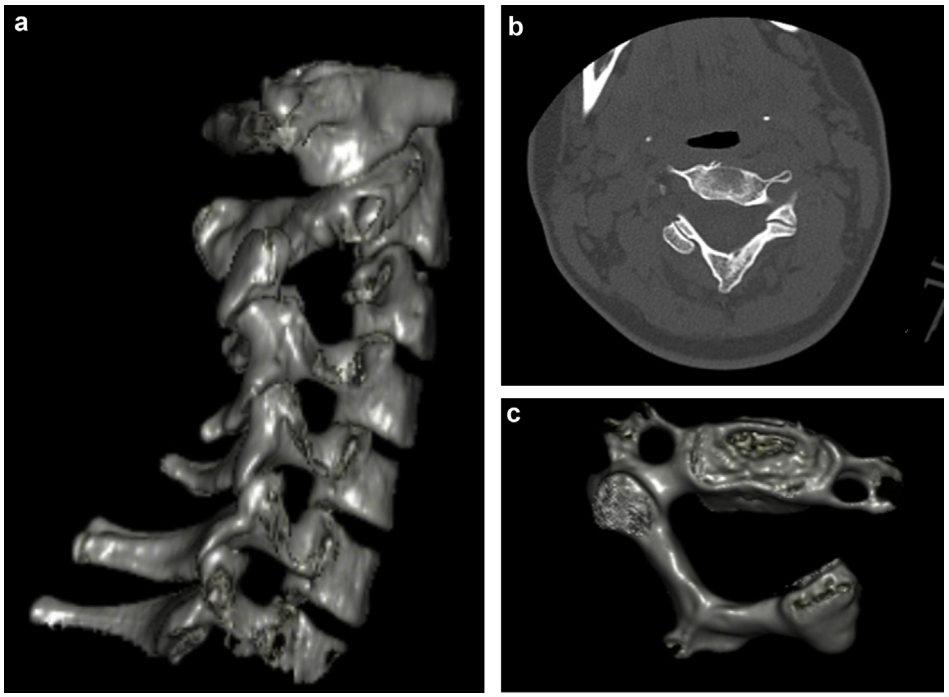

Fig. 2. 3-dimentional volume rendering (a and c) and axial CT scan (b) shows the three characteristics described by Wiener et al.: (1) the false appearance of an enlarged ipsilateral neural foramen (a), (2) a dysplastic, dorsally displaced ipsilateral articular (a and b) and (3) a dysplastic ipsilateral transverse process (c).

4. Discussion

The congenital agenesis of the cervical pedicle is a very rare clinical and radiological finding. This abnormality is often incidental and revealed following a traumatic situation. Patients generally consult without any neurological complains with the exception of neck pain, due to the trauma. The embryogenesis of this anomaly was first described by Archer et al. in 1977 [3]. Sclerotome cells start their migration during the fourth week of fetal development, in three ways. The posterior way, surrounding the neural tube and a precursor of the pedicle. Then, during the sixth week of development chondrification points, which quickly merge to create a pedicle and posterior arch, appear. Absent pedicle syndrome results from the failure to develop ventral chondrification centers at seven to eight weeks of gestation. In fact, each vertebra has 6 chondrification centers, with one for each pedicle. A failure in development of one of these centers could lead to the absence of the pedicle.

According to the observation in the literature, the two most common levels of this congenital absence were C6 and C5 [4]. The median age of the population reported in the literature was 32.1 years and the most frequent condition of diagnosis was following traumatic situation.

X-rays are often the first imaging that is performed for neck pain in patients. It can be presented as an aspect of facet dislocation. The CT scan shows three radiographic characteristics first described by Wiener et al. [5]:

- the false appearance of an enlarged ipsilateral neural foramen due to the absent pedicle;