Letter to the Editor concerning “The single transoral approach for Os odontoideum with irreducible atlantoaxial dislocation” by Wang X, Fan CY, Liu ZH, Eur Spine J. 2009 Jul 14. [Epub ahead of print]

Chao Wang · Shenglin Wang

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Dear editor,

Having read the article by Dr. Zhen-Hua Liu and his colleagues [4] entitled “*The single transoral approach for Os odontoideum with irreducible atlantoaxial dislocation*”. *Eur Spine J.* 2009 Jul 14. [Epub ahead of print], we appreciate their efforts on this topic. However, we wish to bring some attentions to the authors and readers of *European Spine Journal*:

1. In this case report, the authors presented a patient with Os odontoideum and atlantoaxial dislocation. They imputed the cervico-medullary compression to the posterior arch of the C1. Obviously, the authors misunderstood the etiology. In the setting of Os odontoideum and atlantoaxial dislocation, the site of compression is ventral from the vertebral body of the axis. From their Fig. 3, we can easily find the compression was from C2 body instead of the posterior arch of the C1. On this etiology, the transoral approach and anterior decompression were established, replacing the obsolete treatment of dorsal decompression. Unfortunately, the authors were unaware of that principle.
2. The authors made a distinct mistake of confirmation of “irreducible” because their Fig. 1a and c was the same one of neutral position (Fig. 1: note the same position of earbobs and soft tissue images, although the two

pictures had different color). They described C1/2 could not be reduced underwent skull traction with 4 kg for 2 weeks, however, “irreducible” images under the traction were not provided. In this point, the dislocation cannot be demonstrated as “irreducible”. Although being evaded in the present case report, Kerschbaumer et al. [1] suggested that the irreducible atlantoaxial dislocation (IAAD) should be diagnosed with the patient under anesthesia if reduction under traction was impossible. Only these IAAD patients have the indication of transoral approach [1]. Lacking the confirmation of “irreducible” atlantoaxial dislocation, the case of Dr. Liu had no indication of this approach.

3. We noticed the anterior plate of Dr. Liu was similar to that of Kerschbaumer, nevertheless without combined posterior wire fixation. In his paper, Kerschbaumer et al. [1] reported screw loosening in the isolated anterior plate fixation for IAAD, therefore they added posterior wire fixation. Dr. Liu repeated the prior treatment of single anterior plate fixation, but screw loosening was not observed. They considered single transoral approach was effective for IAAD [4]. Most likely, their case was not up to the “irreducible” criteria, and their C1/2 subluxation had less flexibility to rebound than IAAD. Based on the disputed case, Dr. Liu’s conclusion was not so persuasive.
4. Transoral approach and tracheotomy are uncomfortable and potentially hazardous due to the increased risk of infection for the patient. We believe that if the dislocation can be reduced by skull traction under general anesthesia, the transoral approach should be avoided and replaced by single posterior fixation [3]. According to the preoperative images, our patient had more severe C1/2 dislocation than Dr. Liu’s (Fig. 2a–e).

Approval by the authors’ institutional review board (IRB) was obtained.

C. Wang (✉) · S. Wang
Orthopaedic Department, Peking University Third Hospital,
49 North Garden Street, Haidian District,
Beijing 100191, China
e-mail: wangchao@ynet.com

Fig. 1 The two pictures are from Dr. Liu's Fig. 1a and c. Although the two pictures had different color, the same position of the spine, head, earbobs and soft tissue images can be found. We presume the authors made a mistake to provide the extension X-ray. Note the *arrows*

Fig. 2 **a** X-ray of a 15-year-old girl demonstrated the atlantoaxial dislocation. **b** The dislocation cannot be reduced in extension position. **c** Preoperative CT. **d** MRI showed the cervicomedullary compression from ventral side. **e** The patient underwent awaked skull traction for 2 weeks in another hospital, but the dislocation was not reduced. In fact, the traction force was counteracted by the retraction of the muscles, and the test was not up to the “irreducible” criteria. **f** The girl underwent traction test under general anesthesia and muscle

curarization. The traction weight was 8 kg (one-sixth of her weight). **g** 10 min later, fluoroscopic guidance showed reduction had not been achieved. **h** After depressing on the C2 spinous process (*arrow*), C1/2 dislocation was fully reduced. The dislocation was judged as “reducible”. **i** The posterior C1 lateral mass and C2 pedicle screw fixation was performed. **j** Postoperative X-ray. **k** Postoperative CT showed the dislocation was reduced anatomically. **l** Post-operative MRI showed the cervicomedullary junction was decompressed efficiently

However, the anatomic reduction was achieved by single posterior C1/2 screw and plate fixation (Fig. 2i–l). The procedure was less traumatic and simple; moreover, no additional external immobilizations were needed.

5. From Fig. 5b of Dr. Liu's paper, we can learn that the atlas was fixed in posteriorly dislocated position, and the cord was compressed dorsally by the lamina of C2. We presume that anterior plate using in Dr. Liu's paper had difficulty to control the degree for reduction. In the discussion, the authors cited the transoral–tranpalatopharyngeal report of Menezes [2], to support their conclusion of the safety of transoral approach and anterior internal fixation. It should be pointed out that, these 280 cases of Menezes underwent posterior craniocervical fixation instead of anterior internal fixation [2]. Obviously, this report cannot support Dr. Liu's conclusion. With respect to the feasibility and complications of anterior internal

fixation for C1/2, the study of long-term follow-up and large series report is expected.

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