



## Commentary to “A follow-up study on extracorporeal fixation of condylar fractures using vertical ramus osteotomy”

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While reviewing literature regarding recommended approaches for mandibular condyle fracture, we found a recently published by Park et al.<sup>1</sup>, entitled “A follow-up study on extracorporeal fixation of condylar fractures using vertical ramus osteotomy.” Although this article was well written and provided a great deal of information, we would like to make a few recommendations based on recently accepted clinical approaches. This paper will also discuss accepted methods of condylar fracture repair and an updated method, intraoral reinsertion after extraoral fixation, will be introduced along with our commentary on Park et al.’s recently published article<sup>1</sup>.

In Park et al.’s article<sup>1</sup>, the results of extracorporeal fixation were compared with conventional open reduction and conservative closed reduction. Clinical and radiographic findings were analyzed and extracorporeal fixation with vertical ramus osteotomy was found to be a better choice due to its anatomically accurate reconstruction and low risk of complications. Although this article was very well written and provided a great deal of information, we have a few recommendations based on our literature review and on a new approach for mandibular condyle fracture. Two main terminology changes should be considered to best convey the authors’ intended meaning to the readers.

First, conventional condylar fracture approaches look like

an extraoral method. To emphasize extracorporeal reduction of fractured condylar segments, Park et al.’s article<sup>1</sup> addresses whether the fractured segment is attached to the surrounding soft tissue. Thus, a conventional approach would be better to be corrected for its accurate terminology.

In a position paper from the IBRA Symposium on Surgery of the Head—the 2nd International Symposium on Condylar Fracture Osteosynthesis, Marseille, France 2012<sup>2</sup>, the extraoral approach was divided into submandibular, retromandibular, preauricular, and transparotid approaches. In our previously published article<sup>3</sup>, we described extraoral reinsertion after direct reduction and fixation via the submandibular approach, Dr. Nam’s method, and the endaural approach.(Fig. 1. A-C) Direct intraoral reduction and fixation with an angled driver with an intraoral reinsertion approach after extraoral fixation of the fractured fragment are representative intraoral approaches.(Fig. 1. D, 1. E)

Thus, in Park et al.’s article<sup>1</sup> the B group of the conventional method might represent direct reduction and internal fixation via the submandibular approach, which can be compared directly with extracorporeal reduction and fixation via vertical ramus osteotomy with the same submandibular approach. (Fig. 1. A, 1. B)

Second, the term “extracorporeal fixation” was used in Park et al.’s article<sup>1</sup>. This relatively new term can be found in PubMed (<https://www.ncbi.nlm.nih.gov/pubmed/>) in a total four articles<sup>1,4-6</sup>, including Park et al.’s article<sup>1</sup>, using the keywords “extracorporeal” and “condylar fracture.” This terminology was used by several authors to describe fixation of a fragment intentionally detached from the surrounding hard and soft tissue. We have used reduction and fixation methods without interrupted blocking of any surrounding tissue in many fracture patients, and sometimes intentional bone cutting is used for better visualization. In cases of complicated or complex fractures, we have also tried to reduce

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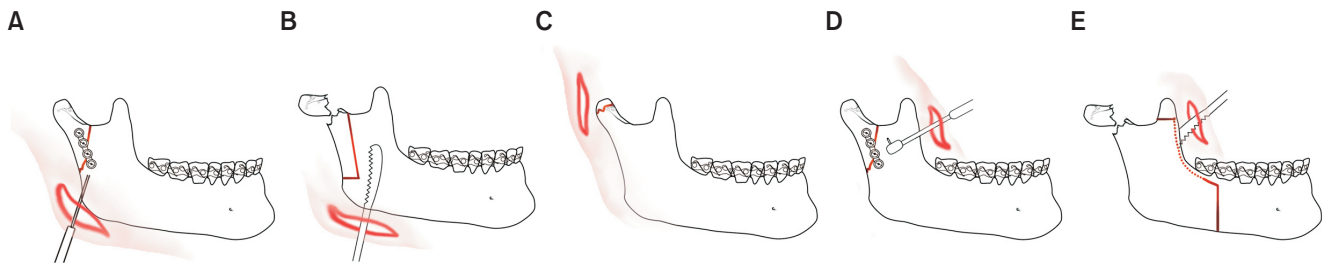
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**Fig. 1.** Five surgical approaches to mandibular condyle fracture: direct reduction and fixation via the submandibular approach (A), Dr. Nam's method (B), direct reduction and fixation via the endaural approach (C), intraoral direct reduction and fixation with an angled driver (D), and intraoral reinsertion after extraoral fixation of the fractured fragment (E). Revised from the article of Kim et al. (*J Korean Assoc Maxillofac Plast Reconstr Surg* 2008;30:72-82)<sup>3</sup>.

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freely moving fragments to their original anatomical position. In condylar head fracture, many fragments must be relocated to their original positions via endaural or submandibular approaches. However, we did not describe these movable fragments as extracorporeal fragments.

The term "extracorporeal" is widely used in the field of cardiac and respiratory medicine to refer to extracorporeal life support, extracorporeal membrane oxygenation, extracorporeal life or lung support, extracorporeal cardiopulmonary resuscitation, and extracorporeal shock wave therapy. Most of these cases involve reviving hypoxemic patients with complicated chest trauma or extracorporeal membranous oxygenation in place of respiratory oxygenation.

For the above reasons, we suggest that "extraoral fixation" should be used instead of "extracorporeal fixation," with "extraoral fixation of condylar fractures via vertical ramus osteotomy" replacing conventional "extraoral direct fixation of condylar fractures" as the most appropriate comparative term. Extracorporeal fixation could be used to describe fixation of fragments that are detached from surrounding soft tissue performed outside of the body, including the jaw. Thus, vertical ramus osteotomy would be used to detach the condyle fracture fragment and fix the fragment to the non-fractured ramus area, which is typical difference with conventional method including intraoral and extraoral approach except extracorporeal fixation method.

We sought to describe the differences between extracorporeal fixation, extraoral fixation, and intraoral fixation in condylar head fractures. These fixation methods should be distinguished using appropriate terminology such as extraoral or intraoral. Submandibular, retromandibular, preauricular and transparotid approaches are also differentiated by extraoral

reinsertion after direct reduction and fixation via a submandibular approach, and an intraoral reinsertion approach after extraoral fixation of the fractured fragment.

### Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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### References

1. Park SY, Im JH, Yoon SH, Lee DK. A follow-up study on extracorporeal fixation of condylar fractures using vertical ramus osteotomy. *J Korean Assoc Oral Maxillofac Surg* 2014;40:76-82.
2. Neff A, Chossegras C, Blanc JL, Champsaur P, Cheynet F, Devauchelle B, et al. Position paper from the IBRA Symposium on Surgery of the Head--the 2nd International Symposium for Condylar Fracture Osteosynthesis, Marseille, France 2012. *J Craniomaxillofac Surg* 2014;42:1234-49.
3. Kim JH, Kim SM, Kwon GJ, Park YW. Clinical review of various surgical approaches in the treatment of mandibular condyle fracture. *J Korean Assoc Maxillofac Plast Reconstr Surg* 2008;30:72-82.
4. Hwang K, Kim HM. Infection necrosis after an extracorporeal reduction of a condyle fracture. *J Craniofac Surg* 2016;27:e304-5.
5. Park JM, Jang YW, Kim SG, Park YW, Rotaru H, Baciut G, et al. Comparative study of the prognosis of an extracorporeal reduction and a closed treatment in mandibular condyle head and/or neck fractures. *J Oral Maxillofac Surg* 2010;68:2986-93.
6. Kannadasan K, Shenoy KV, Kengagsubbiah S, V S, Priya V. Extracorporeal fixation of fractured mandibular condyle. *J Clin Diagn Res* 2014;8:ZD41-3.