Editorial

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Clavicle midshaft fractures should not be considered an easy surgery: reduction and prebending

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Clavicle midshaft fractures are common, often requiring surgical fixation when displaced [1]. While this operation seems straightforward due to the thin soft tissue coverage and easy surgical approach, clavicle midshaft fracture surgery presents several challenges [2].

First, fracture reduction is typically difficult as the lateral fragment is displaced downward by the weight of the arm, and the medial fragment is displaced upward due to the action of the sternocleidomastoid muscle. These force vectors must be carefully considered during reduction. Second, soft tissue dissection must be minimized to promote fracture healing, limiting the field of view to one side of the clavicle and assessment of the angulation of the fracture. Last, the shape of the metal plate does not always match the shape of the clavicle as the curve and the dimension of the clavicle vary by patient; in addition, the location of the fracture is variable. Therefore, optimal placement of the plate can be challenging [3-5].

To address these issues, prebending the plate before surgery can be beneficial. Kim et al. [6] reported prebending the plate using a three-dimensional (3D) printed model based on a mirror image of the contralateral uninjured clavicle. That study appears to have been conducted with a deep understanding of the unique characteristics of clavicle midshaft fractures. I agree with the results of the study, suggesting that a preoperatively prebent plate based on a 3D-printed model that matches the clavicle shape can be beneficial for fracture reduction in terms of operative time and clinical outcome.

In a study conducted by Leroux et al. [7], secondary surgery was performed in 24.6% of operatively repaired clavicles. The majority of these reoperations were for implant removal, with a higher removal rate in women compared to men. The study hypothesized that skin irritation, caused by undergarments crossing the clavicle plate and the overlying skin incision, could be a contributing factor. The higher rate of implant removal in women may support this hypothesis. The prebending method proposed by the authors may reduce skin irritation from the plates and patient discomfort, potentially reducing the need for implant removal surgeries [8].

The image reported as an axial image of the clavicle in the study is not a true axial image. A "true axial image" is a 90° vertical image compared to the anterior view. In the study of interest, the axial image is actually a cephalad image [9,10]. The study's strength is that it provides radiologic parameters (clavicle length and clavicle angle) using bilateral clavicles to evaluate the appropriateness of clavicle midshaft fracture reduction. Additionally, it offers clinical evidence of the cost-effective utility of preoperative prebending using a 3D-printed model [6]. Considering these strengths, I believe the results of the study can greatly benefit surgeons performing clavicle midshaft fracture surgery.

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Conflict of interest

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