

**You Keun Kim, Ho Seong Lee, Sang Gyo Seo, Seung-Hwan Park, Dimas Boedijono, Reply:**

We thank Dr. Gallardo-Molina for your interest in our recent paper published in December 2019 issue of Clinics in Orthopedic Surgery. We appreciate the opportunity to share our thoughts on the points raised by Dr. Gallardo-Molina as below.

As you mentioned, Charcot arthropathy is a severe complication of long-standing diabetes mellitus (DM), which mainly affects the patient's quality of life. Ambulation can be severely limited by the foot deformity or the chronic illness itself. The goal of treatment of Charcot arthropathy is to achieve a stable, plantigrade foot. Therefore, the focus of treatment is on minimizing the impact of the diabetes-related, serious comorbidity rather than obtaining anatomical restoration of the midfoot. There is no debate on the importance of minimal restriction on daily living activities in the management of DM. Poor glucose control profoundly increases the incidence and severity of various chronic complications associated with DM,<sup>1)</sup> and functional ambulation is mandatory for effective glucose control. We reported that sarcopenia increases the risk for mortality in patients who undergo amputation for a diabetic foot.<sup>2)</sup> We believe that long-term immobilization after reconstructive surgery or inconvenience due to total contact casting (TCC) would adversely affect the patient's functional ability.

In the management of hindfoot Charcot arthropathy, hindfoot arthrodesis surgery or rigid cast immobilization is necessary to prevent its progression to hindfoot deformity or instability, which will eventually result in poor walking ability. However, in the case of midfoot Charcot arthropathy, limitation of walking ability is minimal even with some degrees of midfoot deformity. In our study, midfoot Charcot arthropathy showed little progression without TCC, arthrodesis, or reconstructive surgery. Meaningful arch collapse occurred only in four of 38 feet (10%) and the patients could ambulate well even with a flattened foot. Among the 38 feet (34 patients), plantar ulcers related to bumps were found in two feet (5.3%) and bump-related plantar pain occurred in three feet (7.8%).

Simple bumpectomy may be needed for selective cases of plantar bump-related ulcer or pain.

For the treatment of Charcot arthropathy, offloading procedures are important, and TCC can be a good option. However, it has potential complications:<sup>3)</sup> cast-related problems, such as muscle atrophy and poor hygiene, should be considered. Successful TCC, even in the hands of an experienced physician, may result in subsequent ulcerations in 30% of patients during treatment.<sup>3)</sup> Furthermore, it is difficult to determine when and how long the TCC should be applied. It is not easy to assess the Eichenholtz stage. As you mentioned with the Botek's report, it takes approximately 3 to 12 months until acute inflammation disappears.<sup>4)</sup> There is no well-designed comparative study about the effect of TCC on prevention of arch collapse in midfoot Charcot arthropathy.

Surgical reconstruction of midfoot Charcot arthropathy has technical difficulties and associated complications.<sup>5-8)</sup> Although many surgical trials have been conducted for successful midfoot Charcot arthropathy, no gold standard surgery has been established. Invasive interventions can cause more harm than good. Considering complications related to TCC and reconstructive surgery, we suggested a simple treatment strategy that focuses on ulcer control rather than reconstruction for midfoot Charcot arthropathy. For some cases, however, simple bumpectomy with close follow-up may be needed to prevent catastrophic infections.

### CONFLICT OF INTEREST

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

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<https://doi.org/10.4055/cios20025re>

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