

Response to Letter to the Editor Regarding “Fixation of Unstable Osteochondritis Dissecans Lesions and Displaced Osteochondral Fragments Using New Biodegradable Magnesium Pins in Adolescents”

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Dear Editor,

We thank you for your interest in our article entitled “Fixation of Unstable Osteochondritis Dissecans Lesions and Displaced Osteochondral Fragments Using New Biodegradable Magnesium Pins in Adolescents”¹ in which we have reported our short-term follow-up experiences with biodegradable magnesium pins.

As there is no single question in the letter to the editor we would like address the use of biodegradable material in general, radiolucent signs (RS) and functional outcome.

We agree with the reviewer that, depending on the configuration of fractures, titanium and stainless steel screws might be the better choice and are still used in our clinic for the fixation of fractures in children and adolescents, especially when compression of the fracture is needed as there is no biodegradable flat washer available.

Our study is only about intra-articular lesions. Fixation of these lesions with nonbiodegradable material is not recommended from our point of view. Compared with polylactic acid-based implants which were previously used at our department and had caused some problems with regard to intra-operative handling, magnesium pins did not cause any intra-operative complications, provided more stability and allowed for more contact pressure on osteochondral lesions due to the nail head design, thus, a faster healing must be presumed.

Similar to presumably every other surgeon, we were also irritated by the RS on radiologic follow-up in the beginning. Due to the inherent material properties, magnesium-based implants degrade over time, releasing hydrogen gas and causing the radiological phenomenon of RS. To the best of our best knowledge, there are no histological analyses of magnesium-based implants in humans available. We could prove that RS were apparent in all patients but decreased in size during the follow-up period and were therefore self-limiting.²

With 12 of 19 patients manifesting complete healing on short-term follow-up and only 1 broken pin out of 67 pins used, we can report on excellent results.

As timely healed lesions are more interesting for readers than completely healed lesions, only these figures were provided in our article. The 6-month magnetic resonance imaging (MRI) and x-ray follow-up and the 9-month MRI follow-up with complete healing of patient no. 12 by way of example are now provided as an attachment.

However, as we are aware of this important and clinically relevant question, we are currently analyzing bone stock around magnesium-based implants with digital volume tomography (DVT) to improve the assessment of RS.

As our study focuses on the use of magnesium-based pins and radiologic follow-up, no information on functional outcome was given. In our clinic, every patient receives a splint postoperatively and orders to walk on crutches with non-weight bearing for 6 weeks. If a deficiency is manifest, vitamin D is substituted. Every patient with surgical re-fixation of an osteochondral lesion presents 6 weeks and 6 months postoperatively as well as every 6 months thereafter with a current MRI. As range of motion is rarely a problem in case of osteochondritis dissecans or patients with cartilage lesions, all patients had full range of motion on 6 months follow-up. Depending on MRI findings, participation in sports activities was allowed. In our study all completely healed patients (12 of 19) were allowed to return to sports with no restrictions.

In summary, there are no studies to date showing higher complication rates using magnesium-based implants compared with polylactic acid-based or conventional implants. To our best knowledge, there are no histological, radiographic, or clinical evidence of implant-induced osteolysis and consecutive treatment failure. Therefore, we are still convinced of the advantages of magnesium-based implants



for refixation of instable osteochondritis dissecans lesions and displaced osteochondral fragments.

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