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CORR Insights

CORR Insights®: Can a Conical Implant Successfully Address Complex Anatomy in Primary THA? Radiographs and Hip Scores at Early Followup

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Where Are We Now?

While differences in the quantity and quality of proximal femoral bone are frequently encountered during revision THA, such variations are less frequently seen during primary THA. Proximal femoral deformities are generally the result of dysplasia, trauma, infection, and/or metabolic conditions. In such scenarios, standard uncemented implants that achieve metaphyseal fixation may not be appropriate. Alternatives for managing these deformities might include cemented stems; uncemented modular prostheses such as the S-ROM (DePuy; Warsaw, IN, USA); titanium, modular, fluted, tapered stems; or uncemented, cylindrical, fully porous-coated stems [1]. Sometimes alternative surgical approaches—such as femoral osteotomies—are worth considering. Another option is to use an uncemented stem that achieves press-fit at the metaphyseal-diaphyseal junction through a long, continuous taper and a cone shape.

In this excellent paper by Zhang et al., the authors studied 49 complex primary THAs that had proximal femoral deformities precluding the use of standard-sized implants. These patients received an uncemented modified Wagner Cone prosthesis (Zimmer; Warsaw, IN, USA). At a mean of 4 years, the authors found a significant improvement in Harris hip scores, a mean vertical subsidence of 1.5 mm, and no radiographic evidence of progressive radiolucencies.

Where Do We Need To Go?

When proximal femoral deformities or bone loss are encountered during primary THAs, such a prosthesis may be of genuine value. However, there are three important considerations that should be studied before this kind of implant is widely adopted for this indication. Foremost, in complex primary THAs, equalizing limb-lengths may often be an issue for the surgeon, and this specific issue should be

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evaluated carefully. This is a particular concern since the Wagner Cone is a monoblock implant, and so it may offer less intraoperative flexibility to modify limb lengths than do modular stems [2]. Second, the lack of modularity narrows options during revision procedures if complications such as instability or deep periprosthetic infection arise [3]; future studies might evaluate whether or not this apparent limitation arising from the implant's design is clinically important. Finally, as with all new prostheses or novel indications, additional investigations in the mid- and long-term are essential.

How Do We Get There?

Historical issues with monoblock constructs, such as the limited ability to modify limb lengths, have largely been addressed with contemporary prosthetic trials that accurately reflect implant sizing and position. As such, it is imperative to place trial components and thoroughly assess intraoperative stability and limb lengths, as well as sizing. For these reasons, it remains my preference to obtain orthogonal intraoperative radiographs with trial components in place. Several complications with stem sizing (and thus, subsidence and/or fracture), placement, and position can be avoided. Future studies investigating limb length discrepancies and instability rates between the Wagner cone prosthesis and modular systems will be helpful. Secondly, surgeons should be aware that with a lack of modularity, revision procedures may require an extended trochanter osteotomy if the stem needs to be revised or removed. Similar to curved osteotomes used to remove well-fixed acetabular components, innovations in techniques and tools to remove well-fixed fluted and tapered stems without an osteotomy will be imperative. Finally, longer-term investigations with larger cohorts will be essential to determine the ultimate success of such stems in complex primary procedures. Given the small number of such complex primary THAs with this particular prosthesis, national registries provide the best opportunity to study longer-term results.

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