Cementless Total Hip Replacement Complications

Three clinical papers in this issue of the Journal address the problems of loosening and recurrent luxation of cementless total hip replacement prostheses in the dog (1–3). The first two of these papers focus on the early loosening of a short stem, threaded femoral component in Helica® total hip arthroplasty in dogs (1, 2). Loosening of this femoral stem was a complication in six of 16 dogs within one year of surgery. Despite detailed radiographic analysis of the geometric orientation of this femoral implant, risk factors for loosening were not identified in this study (1).

The concept of aligning and anchoring a short stem femoral implant in the femoral neck in canine hip arthroplasty, rather than the proximal one third of the femoral medullary cavity, is not new but dates back more than fifty years. This began with the hemi-arthroplasty procedure in which the femoral implant, consisting of a spherical head and supporting short stem, articulated with the hyaline articular cartilage of the acetabulum. Two surgeons, the Judet brothers, introduced a polymethylmethacrylate acrylic femoral head hemi-arthroplasty procedure to human orthopaedics in 1946. Short-term mechanical failures were common due to abrasion and breakage of the acrylic; only in a few exceptional cases did the hemi-arthroplasty endure long-term (4). Similarly, this type of prosthesis implanted in dogs was found to be too weak to withstand the load along the neck, and it failed by breakage (5). Numerous modifications of the femoral implant made of stainless steel, vitallium and titanium were made, and some of these were evaluated at Michigan State University by Brown (6).

Although the hemi-arthroplasty procedure of the canine hip joint fell into disuse clinically, it was an important stepping stone in the long road to development of total hip arthroplasty in the dog. It would appear that loosening of the short stem femoral component represents a failure of early osteointegration. On-growth of bone to porous coated prostheses is influenced by many factors such as the composition and topography of the surface, as well as the local biological and mechanical environment in the immediately adjacent bone. Given that the short stem femoral implant is orientated in a more oblique to transverse trajectory, it might be subjected to greater bending moments and cyclic micromotion, than conventional, axially directed medullary stems. Further research is needed to understand the factors about this implant design and its implantation that leads to excessive micromotion at the bone–implant interface and impaired osteointegration.

With the increase in number of canine total hip arthroplasties being performed, there are now more cases requiring revision procedures. Whereas revision often involved conversion to a femoral head osteotomy, especially in cases of infection and recurrent luxation, there is now more interest in performing a revision arthroplasty. Two case reports of successful revision of short stem femoral implants with the Zurich femoral component or with the cementless BioMedtrix® components suggest some potential options using currently available implants (2, 7). Also, recurrent luxation of cementless BioMedtrix prosthetic hips in two large dogs was successfully managed by revision surgery to increase the femoral head diameter (3). The rationale being that the larger femoral head increased the impingement-free range-of-motion of the joint, and also increased the transition distance required for luxation. Design modifications such as increasing femoral head diameter could be a promising option to reduce recurrent luxation in large and giant breed dogs undergoing primary total hip arthroplasty. We look forward to future research evaluating the outcome of such design modifications in larger patient cohorts.

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Kenneth A. Johnson
Finally, I would direct your attention to our announcement of our winner of the best resident paper award for 2014, appearing in this issue of the Journal. We had many worthy potential recipients of this award, so the competition was fierce. The contribution of our residents to new research published in VCOT is greatly appreciated.

Kenneth A. Johnson
Editor-in-Chief
Sydney

ACVS and ECVS Diplomates and related

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For those of you who plan on submitting a paper to VCOT, and on using this paper, should it be published, as part of your ACVS or ECVS Boards credentials requirement, or related, please do not wait too long to submit. The review process can be rather time consuming, and we recommend to allow at least 5 months for the entire process of submission, review, and revision work.

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Sincerely,
Kenneth A. Johnson, Editor-in-Chief
Laura Lenz, Managing Editor

Best Resident Paper Award

As first announced in 2013, VCOT will have an annual award for the best resident paper which was published during the year. 2014 marks the 2nd year of this award, and you can find out who won by turning to page VIII in this issue.

To be eligible for this award, the first author of the paper must have been enrolled in an accredited residency program at the time of submission of the paper, and the paper has to be published under the category of Original Research or Clinical Communication.

This annual award will consider all applicable resident papers which were published in that year. Judging will be done by an anonymous panel made up of our Editorial Board members and Referees. In addition to being announced in the first issue of the new year and online, the winner will also receive a prize of €500 and a free one-year subscription to VCOT from Schattauer publishers.

References