Reply to Letter to the Editor

Bony Increased-offset Reversed Shoulder Arthroplasty

Minimizing Scapular Impingement While Maximizing Glenoid Fixation

Pascal Boileau MD, Gregory Moineau MD,
Yannick Roussanne MD, Kieran O'Shea MB, FRCSI

Published online: 3 June 2011

© The Association of Bone and Joint Surgeons® 2011

We thank Drs. Van Tongel and De Wilde for their interest in and comments regarding our article [1]. In the Methods section, they questioned the following statements: “it is unclear what they mean when they say it is already more lateralized. If they mean the center of rotation, then this is not correct. The center of rotation does not change by enlarging the diameter of the glenosphere.” We wrote: “The disc of cancellous bone graft thickness was adjusted according to the size of the sphere. A 10-mm graft was used for a 36-mm sphere and a 7-mm graft for a 42-mm sphere since it is already more lateralized than the 36 mm.” We refer to the humerus and not the center of rotation. As mentioned by Drs. Van Tongel and De Wilde, using a 10-mm autograft and a 36-mm glenosphere [$10 + 18 = 28$ mm] or a 7-mm autograft and a 42-mm glenosphere [$7 + 21 = 28$ mm] leads to the same humeral lateralization. This choice in the surgical technique is based on our experience: using a 42-mm glenosphere and a too-thick autograft (10 or 12 mm, for instance), in a patient without glenoid bone loss might cause difficulty at the time of reducing the humerus, which is dislocated posteriorly for glenoid exposure. Our goal with the BIO-RSA technique is

to obtain the same humeral lateralization (28 mm), regardless of the size of the sphere.

Drs. Van Tongel and De Wilde also stated that we “did not describe if there was a difference between the prevalence of scapular notching between the group with a 36-mm glenosphere and the group with a 42-mm glenosphere. This would be interesting to know because using a larger hemisphere on the same position of the baseplate means that there is more prosthetic overhang.” In our series, one of the 10 patients (10%) with a 42-mm glenosphere had scapular notching, whereas scapular notching occurred in eight of the 29 patients (28%) with a 36-mm glenosphere. Using Fisher's Exact Test, we did not find a significant difference in the proportion of patients with notching in the two groups ($p = 0.39$). This probably is attributable to the small number of patients in our series. Almost three times more notching occurred in our patients with the 36-mm glenosphere. Thus, our observations seem to confirm that when a large glenosphere (42 mm) is used with the same diameter autograft (29 mm), the incidence of inferior scapular notching is less. As mentioned, this construct increases prosthetic overhang and could explain these findings. We agree that prosthetic overhang probably reduces inferior scapular impingement and presumably notching [3, 5]. However, with the numbers available in our series, we were unable to confirm these findings. We hope to confirm your results in a larger series of BIO-RSA in the future.

We believe decreasing the risk of inferior scapular notching is not the only benefit of the BIO-RSA [1, 6]. Other problems encountered with the Grammont (medialized) reverse prosthesis are limited shoulder rotation (specifically in internal rotation, with few patients being able to pass their hand in the back), prosthetic instability (more frequent when the prosthesis is implanted through the deltopectoral approach), and loss of shoulder contour [2]. By effectively creating a scapula with a long neck, the BIO-RSA also

(Re: Boileau P, Moineau G, Roussanne Y, O'Shea K. Bony increased-offset reversed shoulder arthroplasty: minimizing scapular impingement while maximizing glenoid fixation. *Clin Orthop Relat Res*. 2011 Feb 1. [Epub ahead of print].)

P. Boileau (✉), G. Moineau, K. O'Shea
Hopital de L'Archet, Service de Chirurgie Orthopedique, Centre
Hospitalier Universitaire de Nice, 151, Route de St. Antoine de
Ginestière, Nice 6202, France
e-mail: boileau.p@chu-nice.fr; chir-orthopedique@chu-nice.fr

Y. Roussanne
Clinique Orthod'oc, 5 Rue Gerhardt, 34000 Montpellier, France

decreases the rate of anterior, posterior, and superior scapular notching (allowing greater clearance for the humeral cup around the glenoid sphere), and therefore, improving shoulder mobility in elevation, abduction, and external and internal rotation. In addition, by lateralizing the humerus, the BIO-RSA improves shoulder stability (because of improved tension of the deltoid and the remaining cuff) and shoulder contour. Finally, in contrast to metallic increased offset, BIO-RSA offers the advantage of maintaining the joint center of rotation at the prosthesis-glenoid interface, thereby minimizing torque on the glenoid component [4].

References

1. Boileau P, Moineau G, Roussanne Y, O'Shea K. Bony increased-offset reversed shoulder arthroplasty: minimizing scapular impingement while maximizing glenoid fixation. *Clin Orthop Relat Res*. 2011 Feb 1. [Epub ahead of print]
2. Boileau P, Watkinson DJ, Hatidakis Am, Balg F. Grammont reverse prosthesis: design, rationale, and biomechanics. *J Shoulder Elbow Surg*. 2005;14 (suppl. 1):147S–161S.
3. De Wilde LF, Poncet D, Middernacht B, Ekelund A. Prosthetic overhang is the most effective way to prevent scapular conflict in a reverse total shoulder prosthesis. *Acta Orthop*. 2010;81:719–726.
4. Frankle M, Siegal S, Pupello D, Saleem A, Mighell M, Vasey M. The Reverse Shoulder Prosthesis for glenohumeral arthritis associated with severe rotator cuff deficiency: a minimum two-year follow-up study of sixty patients. *J Bone Joint Surg Am*. 2005;87:1697–1705.
5. Karelse AT, Bhatia DN, De Wilde LF. Prosthetic component relationship of the reverse Delta III total shoulder prosthesis in the transverse plane of the body. *J Shoulder Elbow Surg*. 2008;17: 602–607.
6. Lévigne C, Boileau P, Favard L, Garaud P, Molé D, Sirveaux F, Walch G. Scapular notching in reverse shoulder arthroplasty. *J Shoulder Elbow Surg*. 2008;17:925–935.