

## Orthopedic prostheses and allergic contact dermatitis: experience in Liège

Sophie BAILLEUX MD, Arjen F. NIKKELS MD PhD, Bitia DEZFOULIAN MD PhD.

Department of Dermatology, University Hospital of Liège, CHU du Sart-Tilman, Liège, Belgium

---

Patients are frequently referred in dermatology by orthopedic surgeons before or after metallic implantation to enlighten a diagnosis of contact allergy to components of their prosthesis. Many reasons explain the growing number of referred patients. First, a global increase in allergies is related to the changing environmental conditions. Secondly, the prostheses and other implanted metallic devices is more and more used, due to improvement in technology and higher life expectancy. And finally, patients present greater expectations in orthopedic surgery. Altogether, the problem of allergies to orthopedic prostheses has become a real public health issue and appears to be responsible of 1% of prosthetic replacements.

However, the physiopathology is not well elucidated and the relevance of allergy tests is still uncertain. In dermatology, the main diagnostic tool remains patch testing, together with Lymphocyte Transformation Test, less often used in daily routine. In this indication, various test series are available including Belgian standard, dental, metal and cement (Chemotechnique).

A review of the available literature on orthopedic prostheses and contact allergies was performed and then compared to the relevance of the patch tests performed in our department. Inclusion criteria gathered patients tested with orthopedic and/or metal and/or dental and/or cement series between January 01, 2018 and December 31, 2020 in a context of orthopedic prosthesis. The different parameters studied consisted in categorizing patient in pre versus post implantation, notifying reason for consultation, comparing results of the patch tests and intensity of the reaction (+++, ++, +, ±, -) and analyzing involvement of the patch tests and existence of a relieve if replacement of the prosthesis. Forty-six patients were included, twenty-one before implantation and twenty-five after, with a large predominance of women. In pre-implantation, eight out of thirteen positive patients benefited from a hypoallergenic prosthesis, all of them with a favorable evolution. In post-implantation, tests seemed to have been useful for two patients out of twenty-five who presented a significant relevance of the patch tests and showed a great relieve after replacement by hypoallergenic prosthesis. However, in many post-implantation cases and for many different reasons, the surgeons didn't perform a replacement after positive patch tests.

In pre-implantation, we recommend that patch tests are only indicated if a history of skin reactions to metals or a history of previous reactions to metallic implants exists but this affirmation is particularly controversial. In post-implantation, dental, metal and cement series should be tested when classic or hypoallergenic prosthesis has failed and other causes had been ruled out.

A lack of data is still problematic and therefore, further studies are required to reach definitive conclusion and universal guidelines.

## References

1. Hallab N, Merritt K, Jacobs JJ. Metal sensitivity in patients with orthopaedic implants. *J Bone Joint Surg Am.* 2001 Mar;83(3):428-36. doi: 10.2106/00004623-200103000-00017.
2. Thyssen JP, Menné T, Schalock PC, Taylor JS, Maibach HI. Pragmatic approach to the clinical work-up of patients with putative allergic disease to metallic orthopaedic implants before and after surgery. *Br J Dermatol.* 2011 Mar;164(3):473-8. doi: 10.1111/j.1365-2133.2010.10144.x
3. Granchi D, Cenni E, Giunti A, Baldini N. Metal hypersensitivity testing in patients undergoing joint replacement: a systematic review. *J Bone Joint Surg Br.* 2012 Aug;94(8):1126-34. doi: 10.1302/0301-620X.94B8.28135.
4. Amini M, Mayes WH, Tzeng A, Tzeng TH, Saleh KJ, Mihalko WM. Evaluation and management of metal hypersensitivity in total joint arthroplasty: a systematic review. *J Long Term Eff Med Implants.* 2014;24(1):25-36. doi: 10.1615/jlongtermeffmedimplants.2014010277. PMID: 24941403.
5. Frigerio E, Pigatto PD, Guzzi G, Altomare G. Metal sensitivity in patients with orthopaedic implants: a prospective study. *Contact Dermatitis.* 2011; 64:273-
6. Dietrich KA, Mazoochian F, Summer B, Reinert M, Ruzicka T, Thomas P (2009) Intolerance reactions to knee arthroplasty in patients with nickel/cobalt allergy and disappearance of symptoms after revision surgery with titanium-based endoprostheses. *J Dtsch Dermatol Ges* 7(5):410–413
7. Basko-Plluska JL, Thyssen JP, Schalock PC. Cutaneous and systemic hypersensitivity reactions to metallic implants. *Dermatitis.* 2011 Mar-Apr;22(2):65-79. PMID: 21504692.