Beware: Non-prosthetic plastic in cemented arthroplasty

A Hussain, K Prasad, S Kumar

Citation

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Abstract

We are reporting the prospect of accidental deposition of a non-component plastic ring from the cement mixing and delivery system in arthroplasties with added risk of infection, wear, osteolysis and component failure. The risk is particularly significant in total hip replacement because of the amount of cement and different cementing techniques. We would like to raise universal awareness of the risk and recommend utmost vigilance from all members of the operating team and the scrub nurse without exception to pre-empt the possibility of it happening. Although training, education and awareness minimise the risk, the definitive solution is the development and use of a cement delivery system without the prospect of detached plastic component.

INTRODUCTION

We are reporting the prospect of accidental deposition of non-prosthetic plastic in cemented arthroplasty, based on our experience in the course of a total knee replacement. We have not come across any such previous reports in orthopaedic literature.

REPORT

Recently, while cementing the tibial surface during total knee replacement in a 71-year old lady, we noticed a ring-shaped bluish tinge in the cement. To our surprise, we retrieved a plastic ring from the cement, which detached from the Cement Mixing and Delivery System (Fig 1a and 1b).

Figure 1

Figure 1a: Photograph of OPTIVAC Cement Mixing System with detached plastic ring.

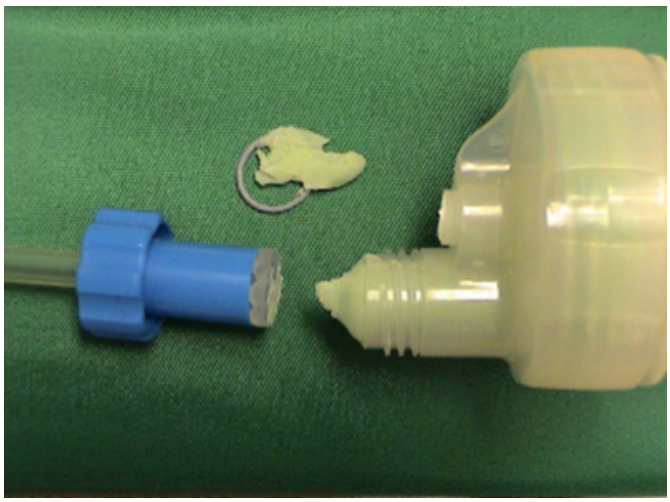


Figure 2

Figure 1b: Photograph of the plastic ring, retrieved from cement.

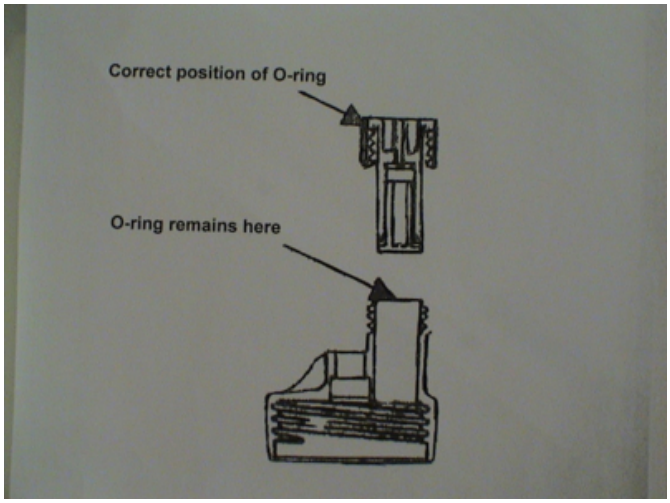
DISCUSSION

Primary total hip and knee replacements are the most common and successful arthroplasties in modern orthopaedic practice with predictable outcome. Contemporary advances in implant design and technology and consistent evolution of surgical techniques contributed to reliable and durable implantation of joint replacements. Most surgeons use cemented prostheses[1,2].

We use OPTIVAC Cement Mixing System (manufactured by Scandimed, Biomet Cementing Technologies) and Palacos R-40 with Gentamycin (manufactured by Schering-Plough Europe, Brussels, Belgium). After mixing the cement, the O-ring from the vacuum connector (blue tube) remained on the threaded adaptor in the top of Optivac system and readily escaped into the cement (Fig 2).

Figure 3

Figure 2: Illustration showing how the plastic ring can detach and how to avoid it. (Adopted from the communication from Scandimed, Biomet Cementing Technologies).



After the procedure, Theatre Sister informed us that a communication was recently received from the company, explaining the risk and preventive manoeuvre. But neither the scrub nurse in our case nor we were aware of the existence of this communication. The communication specified that if the scrub nurse, after breaking the mixing rod, tightens the vacuum connector (blue plug) fully and then untightens to remove it, the O-ring will remain inside the blue plug (Fig 2) and cannot drop into the cement (according to the communication from the company).

It is entirely possible that deposition of non-component plastic inadvertently escaped recognition in the past. The possibility of intramedullary or sub-surface deposition is very real in total knee replacement and other joint replacements. The risk is particularly significant in total hip replacement because the quantity of cement used for fixation of individual components and differences in cementing techniques could easily conceal the plastic ring. The extraneous plastic was spotted in our case and the potential unintended in vivo deposition fortunately avoided by virtue of diligent attention to detail (or sheer chance!).

We recommend that all members of the operating team and scrub nurse should be acutely aware of the risk and remain alert to pre-empt accidental deposition of non-prosthetic plastic in cemented arthroplasty. The potential for unpredictable and accelerated diversity of qualitative and volumetric wear, local osteolysis and component failure[3] is daunting. Surgeon and nurse education, training and

alertness minimise the risk, but the definitive solution is the development and use of a cement mixing and delivery system without any loose plastic component at any stage.

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