The Use of Bladder Syringe for Cement Application in Total Knee Arthroplasty

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Summary: There are various techniques of cement applications in total knee arthroplasty with a lack of clear consensus on best practice. The use of a bladder syringe as a reservoir and applicator of cement allows for minimal handling of the cement along with greater control and cost savings as compared with the manufacturer cement guns.

Key Words: knee—arthroplasty—cement.

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TECHNIQUES

Implant failure in total knee arthroplasty may be related, directly or indirectly to cement application method.¹ Minimal handling of the cement mix optimizes the mechanical properties of the cement and achieves better penetration and interdigitation.² Different techniques of cement application, including finger-packing and cement guns from various manufacturers, have been described in the literature with no strong evidence in favor of any particular practice.³ To reduce the potential risks associated with manual handling of the cement; we describe an alternative technique of its application.

The nozzle of a 60 mL bladder syringe is scored circumferentially with the saw blade away from the surgical field (Fig. 1) and the plunger is removed. The cement is sucked from the mixing bowl via the syringe inlet utilizing the negative pressure generated by attaching the suction tube to the nozzle (Fig. 2). The nozzle is broken away from the syringe body (Fig. 3) creating an eyehole to facilitate cement delivery with less resistance. The plunger is introduced and the cement is pushed through the eyehole onto the back of the tibial (Fig. 4) and femoral components. The same method is used to apply the rest of the cement to the prepared cancellous surfaces of the tibia, femur, and patella if resurfaced.

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The authors declare that they have nothing to disclose.

For reprint requests, or additional information and guidance on the techniques described in the article, please contact Chang Park, MBBS, MRCS, at changpark3@gmail.com or by mail at Stanmore Royal National Orthopaedic Hospital, Stanmore, HA7 4LP, UK. You may inquire whether the author(s) will agree to phone conferences and/or visits regarding these techniques.

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FIGURE 1. Preparation of bladder syringe.

FIGURE 2. Suction of cement into syringe reservoir.

FIGURE 3. Creation of low resistance eyehole.

CONCLUSIONS

Although procurement pathways of medical equipment within different health care systems vary, thereby affecting the overall cost of each method, one estimates the purchase unit cost of a 60-mL bladder syringe to be between \$2.94 to \$5.88.⁴ Again there are many different cementing systems available and 1 example prepacked delivery vacuum system by a well-known manufacturer was ~\$90 excluding value added tax. In the absence of a clear consensus on current best practice this use of a 60-mL bladder syringe offers a simple technique of cement application in a cost-effective manner as compared with current marketed delivery systems. In contrast to finger-packing techniques the negative pressure used to suck the cement into the syringe reduces any further digitation of the cement in its application, while also benefiting from a controlled application from the nozzle allowing for a more timely application of cement. Although further work is required regarding the cement penetration and interface strength, we advocate this technique as an alternative to established cementing techniques.

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FIGURE 4. Delivery of cement through bladder syringe.

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