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A RADIOLOGICAL COMPARISON OF CEMENT MANTLE THICKNESS AROUND TOTAL KNEE ARTHROPLASTY WITH OR WITHOUT THE USE OF PRESSURIZED CARBON DIOXIDE LAVAGE

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Cemented total knee arthroplasty has excellent long term survivorship, however deficiencies of the cement mantle can compromise results. Minimising cement mantle deficiencies and increasing cement mantle size may improve implant fixation and survivorship. The aim of this study was to evaluate the effectiveness of pressurised carbon dioxide lavage in an attempt to increase cement penetration into bone.

Two consecutive series of TKAs were performed. During the first series (n=69), the bone surfaces were cleaned with pulsatile lavage and then dried prior to cementation. During the second series (n=49), a jet of high pressure carbon dioxide gas was also delivered to the bone surfaces via a hand held device (CarboJet, Kinamed Inc.). Standardised post operative radiographs were examined with respect to depth of cement mantle under the prosthesis, and the presence of mantle defects.

Cement mantle thickness under the tibial component was greater with the use of pressurised carbon dioxide lavage: in the AP view, the cement mantle was 19% thicker (p=0.0004); in the lateral view, the cement mantle was 26% thicker (p=0.0006).

The size of the cement mantle can be increased with the use of pressurised carbon dioxide lavage. It is postulated that the bone interstices are cleared of fat and fluid more effectively than with fluid lavage alone. This may lead to an improved outcome for cemented total knee arthroplasty.