CEMENT AUGMENTATION OF PATHOLOGICAL FRACTURE FIXATION

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Fixation of pathological fractures provides rapid pain relief and often restores mobility (Anderson et al. 1978). The difficulty in achieving strong fixation in pathological bone may be overcome in part by adding bone cement (Harrington et al. 1976). This addition may, however, create fresh problems. The cement may harden before fracture reduction or implant insertion has been achieved, or may be extruded by pressure into soft tissues which may be damaged by the heat generated. A method of overcoming these difficulties has been developed and is particularly useful for pathological fractures with cortical defects. The method is illustrated in the following case.

**Case report.** An 82-year-old lady with carcinoma of the breast presented with a pathological fracture of the femur (Fig. 1). This was treated by internal fixation with a Huckstep nail. At operation soft tumour material was curetted from the fracture site producing a large cortical defect. The Huckstep nail was inserted and the fracture reduced. A 60 ml plastic syringe was then cut in half longitudinally and held over the cortical defect with bone holders. The curved wall of the syringe fitted the cortical profile closely, producing a good seal around the defect. Cement was injected under pressure with a cement gun through a small hole in the cortex next to the defect. Excellent pressurisation was achieved, forcing cement into the defect and the medullary cavity. Cement eventually appeared at the greater trochanter.

During the exothermic curing process the section of syringe remained interposed between the cement and the soft tissues protecting them from the generated heat. The syringe wall was easily removed after the cement had hardened, as polymethylmethacrylate does not bond to the type of plastic used in the manufacture of syringes. The postoperative film demonstrated satisfactory fixation with accurately located and pressurised cement augmentation (Fig. 2).

**Discussion.** The technique described here increases the strength of fixation by introducing as much cement as possible at the site of the cortical defect and by forcing cement into the medullary cavity. Experimentally the filling of cortical defects (Ryan and Begeman 1984) and the introduction of cement into the medullary cavity (Miller et al. 1987) both increase the strength of deficient long bones. The presence of the syringe wall limits the amount of blood mixing with cement – a factor that can decrease cement fatigue life.

The presence of large quantities of radiopaque bone cement does not inhibit union nor does it alter the local tissue response to radiotherapy (Harrington et al. 1976). Moreover the cement is not weakened by therapeutic doses of radiation which can therefore be given without compromising the fixation (Murray, Brueels and Linberg 1974).

The technique described can be modified and used to seal cortical defects during the insertion of unlocked intramedullary devices through pre-placed curing cement, or be applied to fill a defect prior to fixation with plates and screws.

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**REFERENCES**


