Versatility of the Medial Femoral Condyle Periosteal Flap in Trauma Fracture Management

Aswinkumar Vasireddy, BSc (Hons) MBBS Dipl (Tr&Orth) FRCS;
Yat Wing Smart, BMBS BMSc (Hons) MRCS; Asmat Din, MA MBBS FRCS (Plast); Edmund Fitzgerald O'Connor, MBBS BSc (Hons) MRCS FHEA FRCS (Plast)

Purpose: Complications of fractures such as nonunion, infection, and bone loss are challenging cases to manage in orthopaedic trauma. The medial femoral condyle (MFC) periosteal flap was first described in 1991 and has been adapted for use in the management of such cases, utilizing the beneficial biological properties of the periosteum to facilitate angiogenesis and bone growth. The purpose of this study is to present our experience of this technique and its applications in an orthoplastics department at a major trauma center.

Methods: A retrospective review of all patients who had undergone MFC periosteal flaps at our institution over a 2-year period (2020-2022) were included. Data were gathered on patient demographics, treatment history, indication for the flap, site of injury, and operative details including bone graft adjuncts. The outcomes measured included fracture union, need for further surgery, donor site complications, and patient-reported outcome measures (EuroQol-5 Dimensions-5 Levels [EQ-5D-5L], Short From-12 [SF-12], and Disability Rating Index [DRI]).

Results: Records identified 7 patients, the majority of whom were male (6) with a mean age of 38 years. Four patients underwent the MFC periosteal flap acutely and 3 cases as a secondary flap. The sites of injury were all in the lower limb, 5 sustained tibial fractures and 2 had multiple fractures of the foot and ankle. There were no documented cases of donor site morbidity. All patients have achieved evidence of radiological and functional union by 1 year postoperatively. The mean postoperative EQ-5D-5L index score was 0.74 (1.00 is a perfect health score) and mean DRI was 31.5 (0 records no disability). None of the patients have required revision surgery.

Conclusion: Our data demonstrate that the MFC periosteal flap can be used safely to aid union and is a versatile tool that may be used in the management of open fractures, either acutely or secondarily in cases of nonunion or infection. To our knowledge, there are no other reported cases in the literature of its use in the acute setting; therefore, this study aims to contribute to this research gap.