

МЕТОД «ОСТРОГО УКОРОЧЕНИЯ» ПРИ ЛЕЧЕНИИ ОТКРЫТЫХ ПЕРЕЛОМОВ ПЛЕЧЕВОЙ КОСТИ 3В ТИПА С ИСПОЛЬЗОВАНИЕМ АППАРАТА ИЛИЗАРОВА (КЛИНИЧЕСКОЕ НАБЛЮДЕНИЕ)

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Наружная фиксация является альтернативой внутренней фиксации при лечении открытых переломов плечевой кости. Метод «острого укорочения» (acute shortening) хорошо зарекомендовал себя при лечении переломов костей голени, сопровождающихся обширным дефектом мягких тканей. Однако до настоящего времени в литературе не было сообщений об использовании «острого укорочения» при лечении переломов плечевой кости. В статье описан случай, когда при открытом переломе плечевой кости 3В типа со значительным повреждением мягких тканей удалось достигнуть сращения и хорошего функционального результата, используя аппарат Илизарова и «острое укорочение» плечевой кости на 3 см.

Ключевые слова: открытый перелом плечевой кости, метод Илизарова, чрескостный остеосинтез, «острое укорочение».

«ACUTE SHORTENING» AND FUNCTIONAL MANAGEMENT OF A GRADE 3B OPEN HUMERAL FRACTURE USING THE ILIZAROV METHOD (CASE REPORT)

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External fixation is an alternative to rigid internal fixation in the management of significant open fractures of the humerus. Acute shortening to primarily deal with soft tissue defects is well-recognised in the management of tibial fractures. A case is described whereby a grade 3B open humerus fracture with significant soft tissue injury was managed to union by acute shortening and Ilizarov stabilisation, maximising functional recovery. The use of acute shortening in humeral fractures has not previously been described.

Key words: open humerus fracture, Ilizarov method, external fixation, acute shortening.

Open fractures associated with crush injuries are severe and can threaten limb viability. More critical to function than the bony injury are the soft tissue injuries which can further be exacerbated by surgical approaches and techniques. The Ilizarov method is an ideal way to manage such injuries as it allows stabilisation and protection of the soft tissues with minimal iatrogenic damage.

Obtaining closure of significant soft tissue defects can be achieved traditionally with rotational or free flaps; with vacuum assisted closure, or, more recently described, with acute shortening. This is a technique first described in the tibia, whereby deliberate malreduction or shortening of the fracture ends is performed to allow apposition of bone with deformation of the soft tissues to permit primary closure [4, 5]. In the tibia, due to consideration of limb length, subsequent restoration of length is necessary, via proximal lengthening. In the upper limb, minor length discrepancy has little functional

significance, and thus permits this technique to be applied without the requirement for subsequent lengthening.

Case report

A 37 year old sawmill worker sustained a crush injury to his non-dominant upper limb, resulting in a Gustilo and Anderson grade 3B, Tscherne grade 3, AO grade IO4 MT3 NV2 comminuted metadiaphyseal fracture of the distal humerus (Fig. 1) with open wounds measuring 3 x 4 cm medially and 5 x 3 cm anterolaterally and gross tissue contusion. Radial and median nerve deficits were noted on presentation. Under general anaesthesia primary wound excision was performed, with removal of a large non-viable comminuted fragment, with significant residual skin defect over the anterolateral and medial wounds. Monofocal compression with acute shortening via a bayonet reduction allowed primary closure of the soft tissue envelope without the need for a skin flap, and management to union was performed within an Ilizarov

fixator. Union was achieved at 9 months (Fig. 2), during this period full active elbow range of motion and use was introduced after 3 days, and at frame removal elbow range was 0-90 degrees, limited by the anterior aspect of the distal ring (Fig. 3). A posterior elbow release of the trans-triceps Schanz pin track was subsequently

performed with final elbow range from 0-135 degrees. Active elbow power was MRC grade 5 in flexion and extension. Nerve function improved with some residual median nerve sensory impairment. Approximately 3 cm of humeral shortening was evident, which did not interfere with upper limb function.



Fig. 1. Comminuted fracture distal third of humerus



Fig. 2. United fracture following consolidation

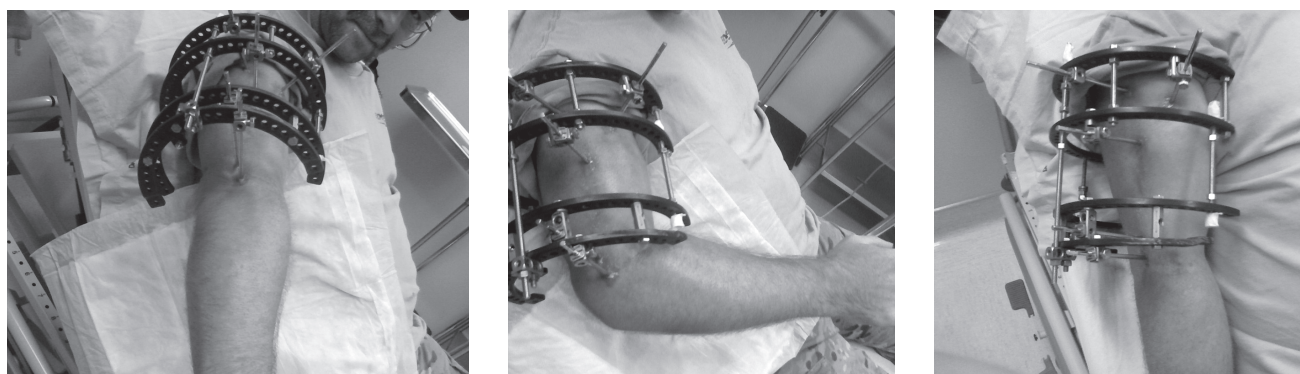


Fig. 3. Clinical photographs prior to frame removal

Discussion

Fractures of the distal humerus contribute high rates of morbidity in adults, with pain, instability, loss of range of motion and neuropathy common [1]. Those which are contaminated pose several management problems [2]. Access to plastic surgery is not always simple, and in the presence of significant soft-tissue loss, achieving soft-tissue cover may be difficult. Anastomosis of free-flaps requires surgical dissection which can cause further injury to already traumatised tissues, and may lengthen limb immobilisation. Concomitant soft-tissue injury can prevent the use of a rotational fasciocutaneous flap. Graft failure occurs, and infection is not uncommon [3].

Acute shortening with coincident or subsequent bifocal lengthening has been shown to be useful

in managing grade 3B open fractures of the tibia [4, 5]. Circular external fixation allows rapid mobilisation of neighboring joints, and protects soft tissues [5, 6, 7, 8]. Early return to activities of daily living is possible, and risks of deep infection and further neurovascular injury are minimised [2, 6, 7, 9]. Shortening of the humerus in the presence of non-union or established defect has been shown to be acceptable, but has not been described in the acute setting [4, 9, 10, 11, 12].

Elbow stiffness is common following humeral fractures, with an extension deficit common [6]. The use of an Ilizarov fixator in this case allowed full elbow extension to be maintained, although some flexion was lost due to scarring down of the triceps at the fracture site requiring subsequent release.

This case highlights the value of circular external fixation in the management of severe trauma using the principles of minimal fixation and avoidance of iatrogenic trauma to the already severely injured limb, in terms of allowing rapid mobilisation and achieving a highly acceptable final functional outcome.

This case also describes the use of the previously described technique of acute shortening in the tibia as here applied to the humerus to allow immediate soft-tissue cover whilst avoiding the morbidity and risks of a free or rotational musculocutaneous flap [3]. Minor shortening of the humerus does not affect clinical function of the upper limb and so can be used to avoid the need for additional treatment.

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