Open fractures

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- Any fracture with an overlying wound should be considered an open fracture. The term previously used was a compound fracture. Open fractures require particular mention because adequate stabilisation of the bony injury and appropriate management of the soft-tissue injury are paramount to ensure a good outcome with a low complication rate. The treatment of bone and joint infection is expensive, laborious and time-consuming for the professional as well as the patient. An infected femoral shaft fracture following intramedullary nailing will typically take 3 years and five operations to clear the infection and achieve union. The Gustilo and Anderson classification of open fractures is the most frequently used classification (Table 32.2). The definitive grade is determined intraoperatively after thorough debridement. It is not based on size of wound alone but takes into account sev eral factors; for example, a farmyard or heavily contaminated wound of under 1 /uni00A0 cm may still be considered a grade III injury . - ould

(b) (a) Figure 32.32 Variations in /f_i xation technique suited to osteoporotic bone. (a) Norian bone substitute has been injected to support the lateral tibial plateau in the partial articular fracture. (b) A locking plate in a proximal humerus. The screws are threaded into the plate to make a /f_i xed-angle device.

union, optimise function and avoid infection. The treatment of open fractures should be considered in two phases: the emer gency department presurgical phase and the surgical phase. Presurgical phase 1 Take a photograph to document the severity of the injury and limit the need for repeated opening of dressings. (Do not delay steps below unduly .) 2 Assess neurovascular status; if compromised and the frac ture is displaced, quickly remove any macroscopic dirt and reduce the fracture/dislocation. It is not essential to achieve an anatomical reduction; simply remove the pres sure from the soft tissues (make a leg look like a leg and an arm look like an ar m). If the bone was out of the skin and is reduced under the skin, then document clearly and inform the surgical team. 3 Once overall alignment is achieved, splint the a ff ected limb; treatment of an open fracture is treatment of the soft tissues. 4 Apply a moist saline dressing to the wound. It is accept able to irrigate the wound with saline in the emergency department to remove any macroscopic dirt, but definitive debridement and washout of the wound should be under taken in a thea tre environment. 5 Administer intravenous antibiotics according to local protocols. It has been shown that early administration of intravenous antibiotics is one of the most important steps. A broad-spectrum antibiotic should be chosen covering Gram-positive, Gram-negative and, if there is severe con tamination, anaerobic organisms. 6 Obtain a tetanus immunisation history and treat accord ingly . 7 Inform a senior orthopaedic surgeon of the injury as soon as possible and make preparations for the surgical phase. Surgical phase In the past an open fracture was considered a contraindication to internal fixation. It is increasingly evident that stable fixation of the bony injury is very important to prevent deterioration of the soft tissues, allowing recovery and healing. Fracture stabilisation

may come in the form of external fixation or internal fixation with screws/plates/intramedullary nails, de pending on the setting. Summary box 32.7 Special considerations /uni25CF /uni25CF /uni25CF /uni25CF zone of injury spreading. Thorough debridement of any con - - taminated or non-vital soft tissue is important. Any loose or devitalised bone fragments should be discarded. Bone defects are easier to deal with than an infected non-union. Soft-tissue reconstruction may involve primary or delayed primary closure of the wound, or more sophistica ted soft-tissue reconstruction options including microvascular free tissue transfer. Continue intravenous antibiotics until 48 hours after defin - - itive wound closure. -

Osteoporotic fractures in older patients may require specialised /f_i xation techniques with locking screw/plate technology and injectable bone cement augmentation Pathological fractures may not heal and require load-bearing not load-sharing implants Arthroplasty in suitable patients bypasses the problems of blood supply and weak bone and allows early full weight- bearing and return to function Open fractures require prompt debridement, stabilisation and adequate soft-tissue cover to prevent infection

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