The objective in treating clavicular non-union is an anatomic reconstruction of the clavicle with an iliac crest bone graft and anatomic locking compression plates. Non-union or bony defects of the clavicle larger than 1.5 cm. Any suspicion of infection, elevated risk of transplant necrosis or recurrent non-union due to concomitant disease, medication, cigarette smoking (>10 cig./d), poor therapeutic compliance regarding specific postoperative management and poor physical status. Patient in beach chair position with a flexible affected arm. An longitudinal skin incision is made below the clavicle with subsequent incision through the clavicular fascia and the periosteum, complex multidimensional osteotomy of the clavicle with medial and lateral axial correction of the pseudarthrosis up to vital bone, harvesting of a tricortical iliac crest bone graft with the size measured in preoperative computed tomography (CT) according to the length of the healthy contralateral clavicle. Final shaping of the iliac crest bone graft regarding the future clavicular position, positioning of the anatomic plate (LCP superior anterior clavicle plate with or without lateral extension, Depuy Synthes, Umkirch, Germany) and drilling and screw insertion under radiological guidance. If necessary additional attachment of the iliac crest bone graft with suture cerclage (FiberWire, Arthrex, Karlsfeld, Germany) or screw should be carried out. A final radiological examination
and hemostasis of the iliac crest with a Lyostypt collagen hemostatic fleece and the clavicle. Drains might be needed and wound closure layer by layer with sutures. Arm sling protection for 6 weeks with physiotherapeutic exercises and increased range of motion every 2 weeks and unrestricted range of motion from week 7 onwards. Full weight bearing is not allowed before week 12 and X-ray examinations to confirm bone healing should be done 3, 6, 12 and 24 weeks postoperatively. Implant removal at an earliest time point of 2 years can be performed when full osseous integration of the graft is radiologically confirmed. At our department 10 consecutive patients suffering from clavicular non-union have been treated with this technique with a minimum follow-up of 1 year. All patients showed anatomic restoration of the radiologically confirmed healed clavicle with very good patient satisfaction.