This article introduces a series of contributions concerning new techniques of minimally invasive fracture surgery.

Rodrigo Pesantez

Minimally invasive osteosynthesis

In an editorial in “Injury” Stephan Perren asked two questions:
1. What can we expect from minimally invasive technology?
2. Are the length and the position of the skin incisions critical?
Although we still are looking for the answers, minimally invasive surgery has become part of many different surgical specialties. In fracture treatment it began with intramedullary nailing and external fixation, and has evolved to become part of the orthopedic surgeon’s armamentarium with all types of implants.

Minimally invasive surgical technique avoids the additive open surgical trauma to the noninjured components of the fracture site by preserving the vascularity to the bone, periosteum, and soft-tissue structures. During the late eighties, Jeffrey Mast, Ronald Jakob, and Reinhold Ganz published “Planning and Reduction Techniques in Fracture Surgery,” which reported their techniques for indirect reduction of fractures. These methods decrease the surgical dissection at the fracture site and rely on traction across the intact soft tissues to obtain a reduction. Although compression was still widely applied for fracture stabilization, the goal of these procedures was to maintain bone perfusion so as to assure a “biological internal fixation.”

Krettek et al published their results on minimally invasive plate osteosynthesis, initially using conventional plates (DCS, angle blade plates, LC-DCP, etc) and then evolved to locked internal fixators and LCPs. Despite these “new advances,” what must be realized is that all fracture fixations must respect the viability of the soft-tissue components in the zone of injury. To achieve this goal, new reduction clamps and instruments were developed to improve the quality of reduction and ease of percutaneous plate application. But malalignment and inadequate fracture fixation are the price we pay if care is not taken in the application of minimally invasive fracture surgery.

In the last issue of AO Dialogue, there was an excellent review about intramedullary nailing and its expanded indications. In this issue, several experts in minimally invasive plate osteosynthesis will outline how to apply this technique successfully. William Belangero, Juan Concha, and Bruno Livani review the use of plates in humeral shaft fractures, Rami Mosheiff takes a look at the different options around the pelvis and acetabulum, and Edgardo Ramos, Fernando Garcia, and Gabriel Chávez discuss the lower extremity.

Minimally invasive techniques for fracture treatment will continue to evolve, and probably what is today considered minimally invasive will be considered maximally invasive in a few years. So we have to keep on working to improve our current techniques for the future.

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