The AO-plate for external fixation in 12 cases

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The AO-plate was used for external fixation in 12 patients. The main indications were severe open fractures of the forearm and infected pseudarthroses at several locations. In 10 cases, the fixation provided enough stability to allow bone healing. The technique is simple, is convenient for the patient, and is always available without additional special equipment.

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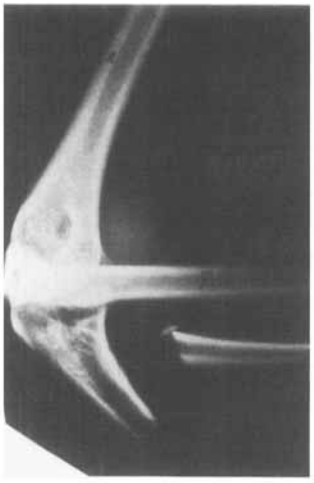
We describe our experiences with normal AO-plates used as external fixators (Marti and Besselaar 1984).

Patients and methods

During the last five years, we have treated 12 patients (3 women and 9 men, aged 20–52 years) with AO-plate external fixation. Four of these patients had severe open fractures of the forearm; 1 patient had septic arthritis of the shoulder; and 7 patients had an infected defect pseudarthrosis of the clavicle, humerus, forearm, or tibia.

A DC- or round-hole plate was contoured and exactly adapted to the local shape of the body, allowing enough, but minimal, distance to the skin. Stab incisions of the skin and underlying soft tissues were made through the holes, and 4.5-mm-cortical screws were inserted into the bone after drilling, taking length measurements, and tapping. Rigid fixation of the screw heads to the plate was obtained by using both nuts and washers. A secondary correction was made simply by contouring the plate with bending pliers.

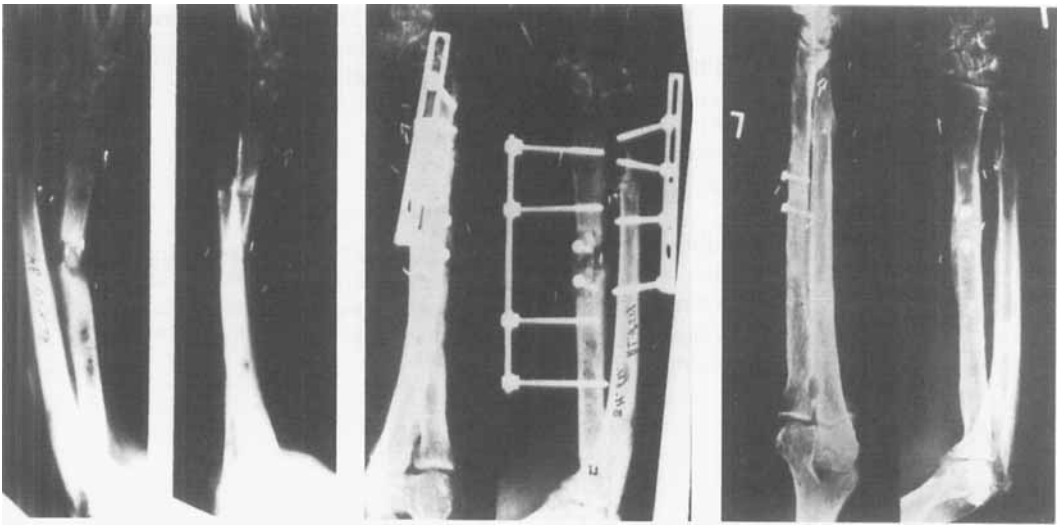


At admission.

Treated with a combination of internal and external plate fixation.

The hardly disturbing external fixation system.

Figure 1. (Case 1). A 32-year-old man sustained a severe open Monteggia fracture of the right arm after a fall from a horse.



Infected pseudarthrosis.

After sequestrectomy, application of a corticocancellous bone graft to the radius, and external plate fixation.

After bone healing, the function is poor due to extensive soft-tissue damage and nerve injury.

Figure 2. (Case 7). A 51-year-old man with a compound fracture of the radius and ulna with associated vessel and nerve injury.

Table 1. Data on 12 patients treated with external fixation using AO-plates

A	B	C	D	E	F
1	M	32	1	1	1
2	M	20	1	1	1
3	M	38	1	1	1
4	M	17	1	1	1
5	F	21	2	2	2
6	F	26	3	3	2
7	M	51	2	1	1
8	M	53	3	1	1
9	M	28	2	1	1
10	M	22	2	4	1
11	M	68	3	4	1
12	F	22	4	5	1

A Case
B Sex
C Age
D Diagnosis
- 1 open fracture
- 2 infected pseudarthrosis
- 3 infected defect pseudarthrosis
- 4 arthritis

E Location
- 1 forearm
- 2 clavicle
- 3 humerus
- 4 tibia
- 5 shoulder

F Clinical result
- 1 bone healing and/or elimination of infection
- 2 instability

Figure 3. (Case 12). A 22-year-old woman with septic arthritis of the shoulder joint after previous surgery was treated with debridement, insertion of gentamycin beads, and external fixation using a broad AO-plate, which served as a tension band. The arthritis healed.

Results

In 10 patients the fixation provided enough stability to allow uneventful bone healing and/or to eliminate infection. Only during the treatment of chronically infected pseudarthroses of the clavicle and the humerus did secondary instability occur; after several months the screws loosened owing to progressive osteitis.

Discussion

The described technique (Marti and Besselaar 1984) was developed independently of us in Poland by Ramotowski and Granowski (1987) as so-called ZESPOL-osteosynthesis. Our experiences using normal AO-plates as external fixators are unequivocally positive.

Stability is high due to the short distance between the plate and the soft tissues. Moreover, loosening of screws is rare once the grips of the screws are optimal in the threaded drill holes. Further, the plate is easily adapted, and the technique is simple. Finally, this system is inexpensive, is convenient for the patient, and is always available without the need and use of any special equipment.

References

Marti R, Besselaar P P. Die Anwendung der AO-Platte als Fixateur externe. *Z Orthop* 1984; 122 (2): 225–32.

Ramotowski W, Granowski R. ZESPOL-Osteosynthese im Oberarmbereich. *Beitr Orthop Traumatol* 1987; 34 (11): 565–70.