Реконструктивные стабилизирующие операции в ортопедической хирургии стопы по Илизарову

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Reconstructive stabilizing surgeries in foot orthopaedic surgery by Ilizarov

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В статье представлены результаты лечения 39 больных с деформациями стоп. Среди них было 25 мужчин и 14 женщин. Средний возраст – 34 года (в пределах 21-63 лет). Посттравматические деформации отмечались в 12 случаях. Средний период контроля составлял 24 месяца (от 12 месяцев до 3 лет). Аппарат снимали через 3-7 месяцев. У 35 больных не отмечалось ни нервных, ни сосудистых осложнений; не было также и глубоких воспалений в области путей проведения спиц. Авторы считают, что аппарат Илизарова лучше всего показан для лечения тяжелых деформаций стоп, когда традиционные методы лечения применять опасно. Коррекция обычно начинается через 3-4 дня, как только больные в состоянии переносить стихающую боль. Недостатки метода в данном случае такие же, как при всех видах наружной фиксации, и связаны они, главным образом, с участками проведения спиц.
Ключевые слова: стопа, деформации, чрескостный остеосинтез, аппарат Илизарова.

Treatment of 39 foot deformities using the Ilizarov apparatus is described. There were 25 men and 14 women with the average age - 34 (min. 21, max. 63). Posttraumatic deformities occurred in 12 cases. A partial weight-bearing with two crutches was permitted as soon as the patient was able to stand up without pain. The device was removed after 3-7 months. Average follow-up was 24 months (min. 12 months, max. 3 years). No nervous or vascular complications occurred in 35 patients, nor deep pin track infections. The authors think the Ilizarov apparatus is mostly indicated for treatment of severe foot deformities, when traditional methods could meet some risks. Progressive correction starts usually after 3-4 days, as soon as patients are able to tolerate decreasing pain. The disadvantages of the method are those found with all forms of external fixation and are predominantly related to pin sites.
Keywords: foot, deformity, transosseous osteosynthesis, the Ilizarov apparatus.

INTRODUCTION

After introduction of Ilizarov methods and apparatus in orthopaedic surgery new age of improving treatment methods of the patients with foot diseases and injuries consequences has begun.

Graduated distraction or compression was performed as minimum, as 1 mm a day, in 4-th day after surgery, forming a bone regenerate of necessary amount and configuration. Accordingly, apparatus was assembled with multiplaned hinges which were mounted from the brackets and that gave a possibility to change external support position relative to each other simultaneously in several planes.

Conventional surgical procedures in the treatment of foot deformities can be difficult to use and not completely reliable in some cases. Traditional methods consist in extensive bone resections with significant shortening of the foot and does not avoid the risks of vascular and nervous injuries. With external fixation we are able to progressively correct deformities using the tension-stress effect as suggested by Ilizarov with minimal bleeding and without neurovascular damage. In fact during the processes of elongation of bone and the correction of deformities by distraction osteogenesis, the adjacent soft tissues are elongated and rearranged.

The skin is often not sufficient to obtain a complete correction at the time of surgery. Sometimes, overall in post-traumatic deformities, the skin is atrophic and the position of neurovascular structures related to usual anatomical reference points may be changed. Moreover consolidation defects and retraction scars may be

severe complications of this kind of surgery. Usually only a minimally invasive surgery like the elongation of tendons and release of soft tissues is combined to external fixation. Nevertheless, when mechanical obstacles, like severe bone anomalies, are present, it is possible to perform also a major open surgery with multiple osteotomies, using the Ilizarov apparatus either to complete or to maintain the correction obtained.

MATERIALS AND METHODS

In the first special hospital for orthopaedic surgery and traumatology in Ohrid, Republic of Macedonia, we treated with Ilizarov apparatus 39 foot deformities. There were 25 men and 14 women. The average age was 34 (min. 21, max. 63). Post-traumatic deformities occurred in 12 cases. The deformities were due to neuromuscular - in 7, congenital diseases in 20 cases.

A partial weight bearing using two crutches was permitted as soon as the patient was able to stand up without pain. The fixator was removed after a period ranging from 3 to 7 months (average 5 months).

Patients were controlled at an average follow-up of 24 months (min. 12 m., max. 3 y.).

According to Paley et al., 1993, the results were rated satisfactory of unsatisfactory. To be assigned to the first group a patient had to present a clinical and radiographic plantigrade foot, an improvement in gait (if previously abnormal) and absence of pain. A pre-operative planning was performed on the basis of X-rays and/or MNR images. The characteristics and the degree of the deformity were analyzed with computer assisted procedures.

RESULTS AND DISCUSSION

No nervous or vascular complications occurred in the 35 patients, nor deep pin track infections. According to Checketts classification, superficial pin track infections (grade 1, 2) occurred rather frequently but all healed with just a more accurate local care and in some cases oral antibiotic therapy, without jeopardizing the end result. A particular assembly was used at the distal third of tibia. At this site traditional transfixation scheme gives constantly problems of pain and consequent limited joint motion because the wires pass close to tibialis anterior, extensor hallucis longus and extensor digitorum communis tendons anteriorly and the os calcis tendon posteriorly. These areas are subjected to sliding during walking and this leads to inflammation, pain and at the end, stiffness of the ankle. So, we cross the wires of the tibial ring not on a horizontal plane but on a frontal one. In this way the wires pass through areas where the bone is only covered by skin and no tendons are closed. For this crossing, close to the center of rotation of the ankle, we use two olive stop wires. The wires are usually fixed with posts placed on the same plane, instead of the traditional combinations of single posts, so to make easier and quicker the assembling of the apparatus. This component is now produced by a French trade. Two types of frames may be used: constrained and unconstrained. In the first one the correction is performed around the axis of rotation of the joint involved in the deformity. An uniaxial hinge is used and must be exactly placed in line with the joint deformity. The success of the method depends on an accurate preoperative planning. In fact it is very important to establish the most adequate position of the hinges which must respect the anatomical axes of foot joints. So we use to perform a computer assisted planning which help us to define the exact position of the articular axes. An unconstrained system can also be used. In this case the correction is done around the natural axes of rotation of the joints and soft tissue hinges. This system is useful for the treatment of multiple joint deformity when it is not possible to locate a single axis of rotation.

CONCLUSIONS

In conclusion we think that Ilizarov apparatus find its best indication in the treatment of foot severe deformities in which traditional methods could meet some risks. In these cases the one-stage surgical procedure exposes the patient to the risks of traction injuries to the nerve and vessels which are stretched. Excessive scarring, skin slough and non-union can also occur following complex surgical foot procedures. Furthermore with the circular fixation one is able to obtain the desired correction either acutely in the operative room or gradually after operation. The progressive correction starts usually after a period of 3-4 days, as soon as the patients are able to tolerate the decreasing pain. The disadvantages of the method are those found with all forms of external fixation and are predominantly related to pin sites. With local or general antibiotics we have never met deep infection. Sometimes we perform a minimal surgery on soft tissues, which helps us to correct the deformity through progressive distraction. In the presence of fixed bony deformity, if the patient is

older than eight years, we use to perform at the same time an osteotomy procedure. To retain the obtained correction a brace or a cast may be required. If the stability obtained is considered not satisfactory, a surgical arthrodesis is performed decreasing the risks of a one-time surgery.

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