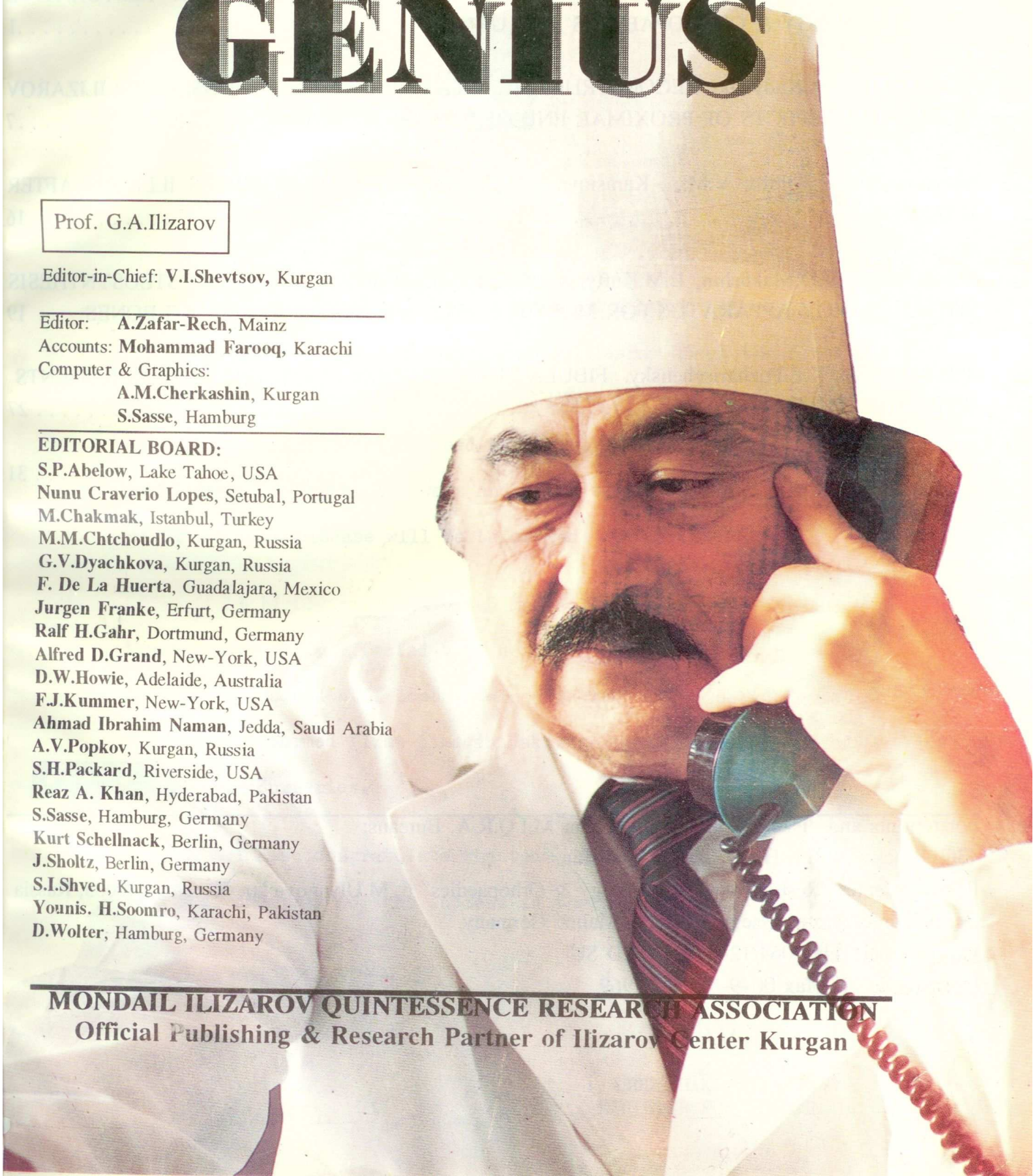
December 1993 (No 2)

Orthopaedic GENIUS



MONDAIL ILIZAROV QUINTESSENCE RESEARCH ASSOCIATION
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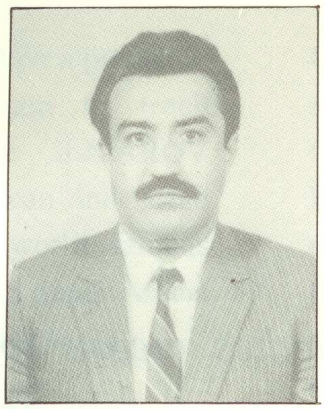


Karachi, dated the December, **1993.**

MESSAGE

It is great pleasure for me to learn about the first issue of medical journal on "OTHOPAEDIC GENIUS". The aim and objective of the issue are definately indeed laudable. The publication will also highlight and suggest the ways and means through which the effecties of Orthopaedic Disease will be benefited.

I highly appreciate the medical research made for the treatment of polio effected bone deformeties, congenital bone deformeties, accidental bone deformeties and other such deformeties which are performed first time in Pakistan by Ilizarov method of Orthopaedic Surgeries.

I also congratulate the team of M.I.Q.R.A. for initiating this step and pray for the success in their endeavour.

(ABDUL HAKIM BALOCH)
MINISTER FOR HEALTH

"To be a genius in orthopaedics means to be a gentleman, a surgeon and especially a doctor passionately devoted to the care of physically disabled, from congenital malformations in children to degenerative diseases in the elderly"

G.Fabry, M.D., Ph.D.

Professor and Chairman
Orthopaedic Department
Katholieke Universitet
Leuven, Belgium

PREFACE

For several years we have worked on a project to prepare an international program to teach Arthroscopic Surgery and the ILIZAROV Technique, especially in the African and Asian countries. Until now, several world famous surgeons have visited Pakistan and Saudi Arabia and have performed perfect operations.

During this period we observed that the majority of the Doctors start their practice with high motivations after they have specialized in a particular field. But not even Doctors in Europe and America get enough time to learn the right technique of surgery for each particular case. Thus they may fail to achieve proper results on certain patients.

In view of these observations, our objective is to prepare a program not only for the Asian countries but to launch international training program to teach ILIZAROV Method of treatment as an additional surgical technique of tremendous variability and relevance.

I discussed in detail our objectives with Prof.ILIZAROV when I met him for the last time on 19 July 1992 in Ulm and he willingly agreed to help me with the implementation of my plans. He motivated me to publish an international journal to project and propagate the ILIZAROV techniques. Unfortunately Prof.ILIZAROV passed away soon after this meeting, but the work he started has gone on and his revolutionary techniques of orthopaedic surgery have rehabilitated millions of disabled people.

On October 6, 1992 the Russian Scientific Ilizarov Center "Restorative Traumatology & Orthopaedics" of Kurgan, directed by Prof.Schevtsov joined us officially in our efforts and agreed to cooperate with us. I shall never forget, the untiring efforts he has made to promote this project. Our venture gave birth to a new organization called **M.I.Q.R.A.** - **M**ondial **I**lizarov **Q**uintessence **R**esearch **A**ssociation. This Association is a legally structured platform for discussions and cooperation between the Ilizarov Center and all those surgeons who would like to learn the Ilizarov method as well as the surgeons who are already working with the Ilizarov technique. A totally unique clinical and educational orthopaedic reconstructive and rehabilitation program based on the Ilizarov method was established in Pakistan and has been in operation since November 1992. The finest surgical expertise of the Ilizarov Center of Kurgan was brought to Pakistan, where the need for restorative surgery is overwhelming. Initially, surgery was performed personally by Prof. Vladimir I. Schevtsov on March 7, 1993 at the Dr.Ziauddin Hospital. Around the same time, an international journal "*Orthopaedic* **GENIUS**" was born. The first issue was introduced on June 15, 1993 in Kurgan. This journal will be published in three languages: English, Russian from February 1994 and Arabic from June 1994. Thus our project in the Dr. Ziauddin Hospital, Karachi, is able to offer you not just the possibility of participating in a clinical activity using high quality products, but will also enable you to publish the results of your work for world-wide

"transosseous osteosynthesis" gained a qualitatively new semantic meaning with its introduction into practice. From collective notion, reflecting only the principle of the fixation of bone fragments, it became the one, determining essence and peculiarities of reparative regeneration of bone and soft tissues in the process of graduated and controlled influence of the mechanical factors - compression and distraction - upon them. The transosseous osteosynthesis by Ilizarov - it is a new technology of osteosynthesis, unknown before possibilities of giving natural harmony to human locomotor system in case of its injuries and diseases, and so possibilities if treatment of the traumatologic-and-orthopaedic patients, which were considered as incurable for a long time. Despite the fact, that more than 300 different apparatus and devices for external fixation of bone fragments are described in the world literature, none of them so widely spread, as the Ilizarov apparatus. Its main feature consists in the fact, that the apparatus design is connected with the new osteosynthesis technology, mentioned above, harmoniously and inseparably. But the apparatus is only one of the leading attributes of the method.

Geography of the Ilizarov method today - it is a map of the world in principle: all the former USSR, and now - countries of Community of Independent States (CIS) and 73 countries of "distant" (from Russia) foreign countries.

As for the history of the origin of the method of transosseous osteosynthesis, which is now identified with the Ilizarov name and is called the Ilizarov method by right, we pay tribute to its gratitude and respect, because none of scientific discoveries takes place on the bare place. There is no science without continuity, it is dead without followers and continuers. In this connection the method of transosseous osteosynthesis is nit an exception. Like all the others, it has its own history, because the ides of external fixation of bone fragments appeared in the remote past. That is why appearance of the external transosseous fixation or another is a usual phenomenon, but each of them is only a fixator and not a method of restorative treatment.

The main scientific legacy of academician Ilizarov - the Russia scientific center "Restorative traumatology and orthopaedics" (RNTs"VTO"), created by him in Kurgan and named after him now. Here he had been a permanent general director and scientific supervisor for more than 20 years. Hundreds of different (operative and bloodless) techniques and variants of practical use and the method of transoseous osteosynthesis were carried out under his leadership. An extremely wide range of indications for its use is determined and substantiated. As a result of continuous improvement of the initial apparatus model unified sets for children and adults were produced. A new generation of apparatuses with automatic distractors, compressing and hinged was introduced into production. Professor Ilizarov always attached great importance to scientific-and-theoretical substantiation of the method in all its details. That is why all the develcpments were performed and are performed now on the basis of complex medical-and-biological and medical-and-engineering fundamental investigations, profound study of effect of compression and reparative regeneration of tissues and general condition of organism during treatment of patients. Different methods of investigation are widely used in addition: histological, histochemical, physiological, radionuclide, biomechanical, methods of

translucent and scanning electron microscopy, radio- and angiography, tissue culture, mathematical modelling, computer tomography and many others.

Characterizing, without going into details, scientific results, achieved at the center, and gained clinical experience (we have information of multifactorial analysis of treatment results of more than 2,5 millions of patients from 1186 medical institutions of the country), we can't do without words "for the first time in the world" or "for the first time in medical practice", and looking at completed and late results of Restorative treatment of patient by Ilizarov, we can't without being astonished at enormous possibilities and extremely wide variability of his method. For example: until recently nobody thought about increase or decrease of human height at any amount, required for him; about elongation of limbs in case of their 50 cm or more shortening, about substitution of large bone defects and soft tissues, surrounding them (skin, muscles, vessels, nerves) without grafting and even in the cases, complicated by purulent infection. the possibility of correction of different complicated and combined deformities and under developments of bone-muscular system without surgeries couldn't be imagined. All this, as well as solution of many other problems in rehabilitation of traumatologic-and-orthopaedic patients, became an every day reality to owing to the Ilizarov method.

Peculiarities of bone growth, not only longitudinal, but transversal one as well, were subjected to profound and many-sided study for the first time, conditions of their transformation and modelling were determined, individual variants of osteogenesis were established, the concept of bone would was substantiated in detail. Not only possibility, but necessity to combine periods of bone knitting and those of anatomic-and-functional rehabilitation of patients were proved. Ways and possibilities were substantiated concerning decrease of treatment periods and considerable (2-5-fold) reduction of disability during of limb bone fractures of all types and localizations, including gunshot and those, complicated by purulent infection. Physiologicity and sparing character of treatment by Ilizarov, particularly in case of use of bloodless (without surgeries) techniques, and their mobility all over the rehabilitative period allowed to produce a new form of rendering of special medical aid in outpatient conditions.

Death of the director of the Center is a hard less, but life sets new problems and needs their solution. Ilizarov's like-minded persons - scientists of the Ilizarov Center, - understand all this perfectly and don't slacken the pace of work. The Center is the leading one in the world on the problem of transosseous osteosynthesis, development and improvement of the Ilizarov method as before. This is a powerful specialized, scientific-and-research medical and training-and-production complex, mere more than 1,5 thousands of people work; its clinical basis - 800 beds; experimental clinic for 500 large animals; experimental factory for production of new models of apparatuses and devices; specialized faculty for improvement of physicians and their instruction in the Ilizarov method. Everybody, who wants to have such training, has the possibility to do it at any time after agreement with the Center. On leaving subject courses on special program students get a certificate.

At present scientists of the Center perform an intense work on use of the Ilizarov method

not only in traumatology and orthopaedics, but also in other fields of medicine and biology - angiology, vertebrology, stomatology and veterinary. Unique in their significance, techniques of treatment by Ilizarov are developed, concerning patients with such a severe disease, as obliterating endartheriits, treatment of injuries and deformities of spine and pelvis is performed, as well as that of injuries and under development of bones of hand, foot and large joints of upper and lower limbs, consequences of gunshot fractures and many other injuries and diseases of locomotor system. New approaches in principle are worked out, solving the problems of prevention of purulent complications. Good prospects are revealed, using automatic distractors to eliminate large shortenings of upper and lower limbs with simultaneous correction of attendant axial deformities. Results of experimental investigation on substitution of skull bone defects are unprecedented. These are new possibilities of the Ilizarov method in cranio- and neurosurgery. A series of problems on transoseous osteosynthesis was discussed for the first time at the international conference-and-practical conference, devoted to the memory of G.A.Ilizarov, which was held in Kurgan in June 14-16, 1993. Representatives of all Russia regions took part in its work, as well as those of "near" and "distant" foreign countries (USA, Japan, Italy, Portugal, India, Pakistan, Mexico, Turkey and many others).

Traditionally, a great scope of work is done in scientific and practical cooperation with foreign counties. Rapid and purposive inculcation of the Ilizarov method Beyond the bounds of the former USSR began from 1981 and 1982, after visit of Scientific Center in Kurgan by scientists of Hungary, Mongolia, Chechoslovacia, Poland, Italy, Cuba, Germany and other countries. Results of scientific achievements and experience of clinical use of Ilizarov method were demonstrated by the Center more than 40 times at international exhibitions of 37 countries of the world (Angola, Afghanistan, Viet-Nam, Germany, India, Mozambique, China, Japan and many others). Production of the experimental factory of the Center (the Ilizarov convertible apparatuses) was demonstrated at many International Fairs of Siberia (Russia), Syria, Bulgaria, Leipzig and others.

At present Associations on study of the apparatus and method of G.A.Ilizarov (ASAMI) are set in 14 countries of the world (France, Spain, Hungary, Portugal, Belgium, USA, Mexico, Yugoslavia, Pakistan and others).

International Conferences, devoted to study of the Ilizarov method are always held in Kurgan.

Patients of practically all the continents are systematically treated at the Center, training of specialists of different countries is performed every year. Scientific cooperation is conducted with some countries (USA, Italy, Mongolia, Pakistan). Thus, school of professor G.A.Ilizarov is not only the greatest in the country scientific- and methodical RNTs"VTO" in Kurgan, organized by him it stretches far the bounds of Kurgan. Today it is presented by all the countries, which adopted this method controlling illnesses of locomotor system, by all the physicians and scientists, who master the Ilizarov method directly in its cradle, on the basis of the Kurgan Center.

G.A.Ilizarov is most high-titled orthopaedist among all the orthopedists-and-traumatol-

ogists in the world. His work was commended with different rewards, diplomas, honorary titles and with other attributes of profound gratitude and highest appreciation. He is many conferred many rewards and international prizes for surgical treatment of fractures. The International Prize of Muses is considered the most peculiar by us (Italy). G.A.Ilizarov was the winner of this Prize among physicians of the world, as a mark of gratitude of the fact, that surgery is not only a science, but a high art.

In conclusion we consider it pertinent to note, that the Ilizarov era in traumatology and orthopaedics remains at the peak of its creative potential, this is an era of gaining new knowledge, laws and discoveries, characterizing extremely great compensatory possibilities of human organism and his bone-muscular system in specific conditions.

The Scientific Center in Kurgan is an alive monument and grateful continuer of the work of its creator.

Fund of G.A.Ilizarov is made to perpetuate his name on the initiative of scientists of the Center. Contributions from organizations and private persons of Russia and other countries of the world are accepted. Means of the Fund be used for construction of the scientists monument at the territory of the Center and for founding of the International prizes for the best works on transosseous osteosynthesis.

RECONSTRUCTIVE - STABILIZING OPERATIONS AFTER ILIZAROV IN CASE OF DEFECTS OF PROXIMAL END OF FEMORAL BONE.

G.A.Ilizarov, O.A.Kadykalo

(Russian Scientific Ilizarov Center "Restorative Traumatology and Orthopaedics';
General Director - V.I.Shevtsov, M.D.)

Defects of proximal end of femoral bone are referred to the severe pathologies of locomotor system, the treatment of such pathologies is very difficult and actual orthopaedic problem still. The severity of this pathology is complicated by wide scar changes of surrounding soft tissues and as a result of purulent - inflammatory processes and numerous surgeries. Total defects of proximal end of femoral bone on the diaphysis level which occur after tumor resection, unsuccessful endografting or alloplastics of hip joint and infection diseases are considered to be the most difficult. Restoration of supportability and limb length in such patients by traditional treatment methods is difficult and sometimes insolvable task.

Elaborated by one of the authors of the present report (G.A.Ilizarov) reconstructive - stabilizing operations considerably enhance the possibilities of treatment the patients of the pathology. They allow to provide the restoration of supportability and limb length alongwith the widening of perineum space with corresponding reconstruction of proximal end of femoral bone. That improves, especially in female patients, functional treatment results and limb configuration. Relatively low traumatism of surgeries, reliable guided fixation of bone fragments by means of author's apparatus with preservation of movements in knee- and ankle - joints allows the patients to be mobile beginning from the first days of treatment, creates optimal conditions for the rapid regeneration of bone tissue and functional rehabilitation of the patients.

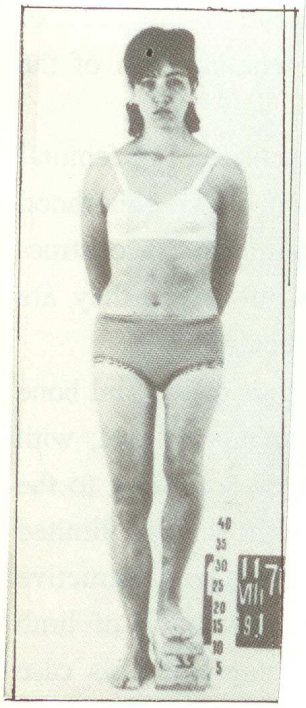
Depending on defect of proximal end of femoral bone volume and its location in the neighborhood with acetabulum different methods of reconstructive - stabilizing operations are used, they are used simultaneously or consecutively.

In large defects of proximal ends of femoral bone with its shifting by the acetabulum level, with large contact area and changes according to the deforming arthrosis type with sharply limited mobility and vivid pain syndrome, reconstructive - stabilizing operation with restoration of limb length is made during one stage. In this case simultaneously with the closed compression arthrodesing in the position of excessive adduction (120 - 130 degrees) of the limb, reconstructive - lengthening compactotomy on the boarder of upper and middle third of the femur. Later on between the fragments of femoral bone the angle, open medially is being created for widening of perineum space and limb lenthening is performed.

Surgery methods. Providing the limb with necessary adduction and bending up to 155 - 160 degrees through the crest of supraacetabulum area of iliac bone, which are fixated in tensed position to the arch of Ilizarov apparatus, assembled with the angle of 30 -40 degrees, open medially to the

plate of pelvic cross section. Through proximal and distal ends of femoral bone 2-3 cross wires are inserted, the upper are fixated in the tensed position to the arch and lower to the ring. The arches are connected by the rods, compression is performed by means of nuts screwing in the area of hip - joint.

Later on oblique compactotomy is performed on the boarder of the upper and middle third of diaphysis of femoral bone in frontal area. Distalend of the femur is abducted to 30 -35 degrees, performing between bone fragments the angle, open medially. Femur is elongated by gradual distraction to the level of functional length of the legs. For illustration we present the following clinical observation.



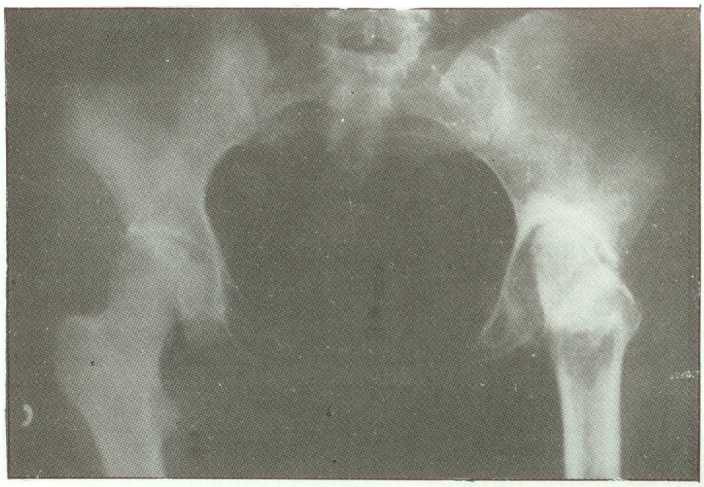


Fig 1 a,b. Patient and X-ray before treatment

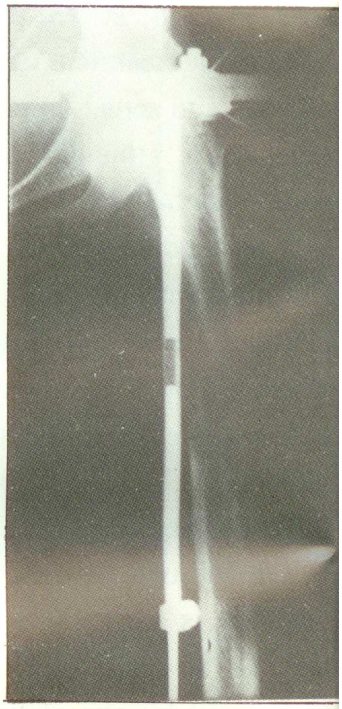


Fig 2 X-ray during the osteosynthesis process

Patient F., 26 years old, medical report No. 1731, diagnosis: defect of the head and neck of the left femur after tuberculosis coxitis, shortening of left lower limb - 13 cm. When she was 22 years old - operation - resection of the left hip - joint with the following arthroplastics (fig 1b). On admission the patient complained to the pain in the hip - joint, shortening of the left leg and vivid limping. Movements amplitude in the area of hip - joint was 30 degrees. The femur is shortened to 10 cm, tibia to 3 cm (fig 1a). Operation was performed: closed compressional osteosynthesis of left hip - joint in the adduction position 120 degrees with simultaneous reconstruction of proximal end of femoral bone with elongation to 9,5 cm (fig 2). Distraction period was 97 days,

fixation period - 100 days. In 6 months after apparatus removal surgical elongation of the tibia to 3 cm was performed. Treatment result was observed during 4 years after apparatus removal. In hip - joint bone - ankylosis in flexion position 158 degrees, abduction of proximal femoral third 110 degrees and adduction of proximal part and abduction of lower part - 85 degrees. Functional length of both legs is equal (fig. 3a,b,c)

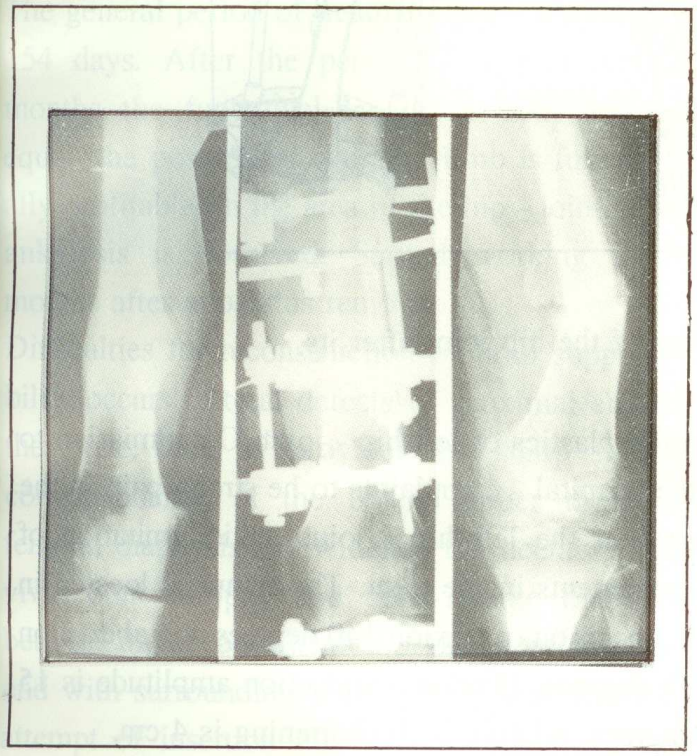


Fig 3a, b, c. Patient abd the X-ray in 1 year after apparatus removal

In defects of proximal end of femoral bone, accompanied by stable abducting contracture, vivid pain syndrome and rapid limitation of movements for ankylosis gaining in the position of adduction of limb wedge-shaped resection is used without subluxation of proximal femoral end. for this purpose through small incision external part of acetabulum roof is seen and neighboring part of proximal femoral end. With the help of two chisels along the direction lateral-to-medial vedge-shaped block is cut simultaneously, including acetabulum roof and neighboring part of proximal femoral end (fig.4a). The height of vedge is calculated in such a way that after elongation with abduction of limb up to the necessary angle we should get dense contact of corresponding bones in the area of hip - joint.

This relatively small surgery under conditions of stable compression fixation with the help of author's apparatus allows to get ankylosis in the short period of time. In male patients the limb is adducted to 83-85 degrees and in this position simultaneously with compression arthrodesing limb elongation due to compactotomy along the diaphysis is performed. In female patients with the aim of widening of perineum space the reconstruction of proximal femoral end is performed (fig.4b). For this aim arthrodesing in the area of hip - joint is performed with femoral adduction up to 120 - 130 degrees. In the upper third of the femur we perform corrective - elongation compactotomy, distal femoral end is abducted to 30 - 35 degrees, creating between the fragments the angle open medially with simultaneous elongation of femur. Apparatus assembly is the same as above - described.

As an example let me show you the clinical observation.

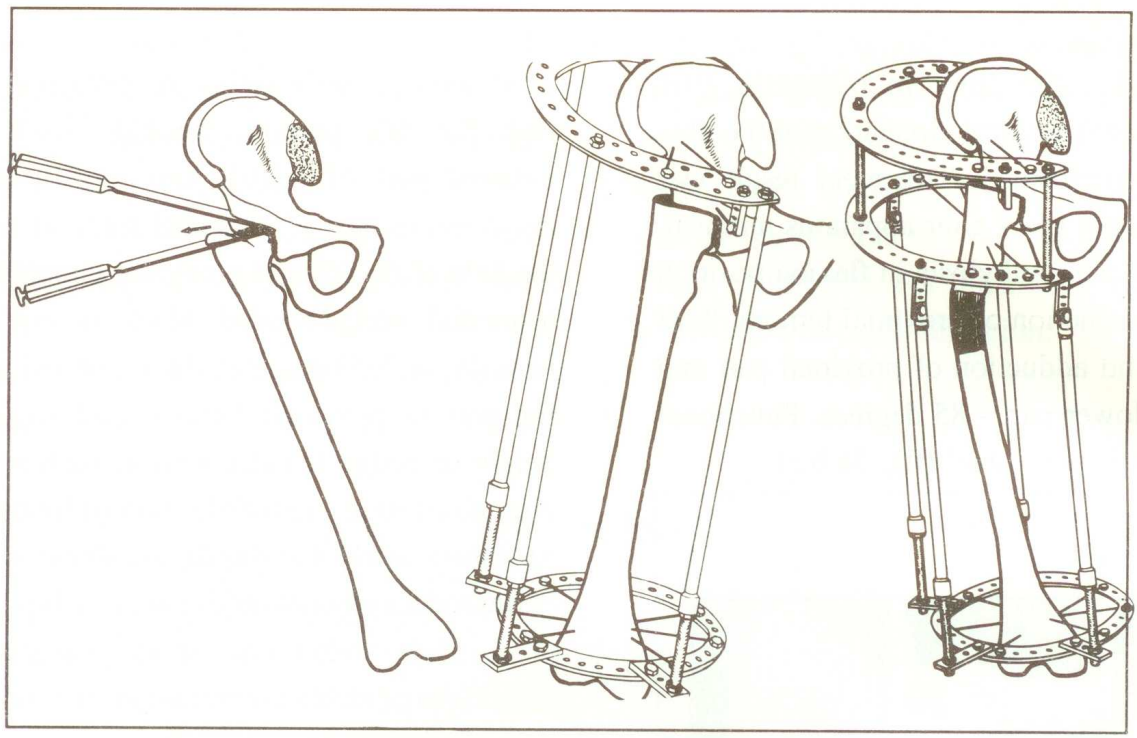


Fig 4a, b, c. Scheme of reconstructive arthrodesis of the hip joint after its vedge-shaped resection

The patient B., 20 years old, medical report No. 1174, was admitted to the hospital on the 18.02.69 with diagnosis: defect of the head and partly the neck of left femur, flexion - abduction contracture of the left femur. At the age of 5 years open reduction of congenital dislocation of femur was performed, it was complicated by aseptic head necrosis. At the age of 12 years - arthroplastics of left hip - joint. On admission to the hospital - complaints to he strong pain in the area of the left hip - joint, vivid limitation of movements in the joint. The femur is located in the position of flexion 140 degrees and abduction 75 degrees. Flexion - adduction amplitude is 15 degrees, relative limb shortening is 4 cm.

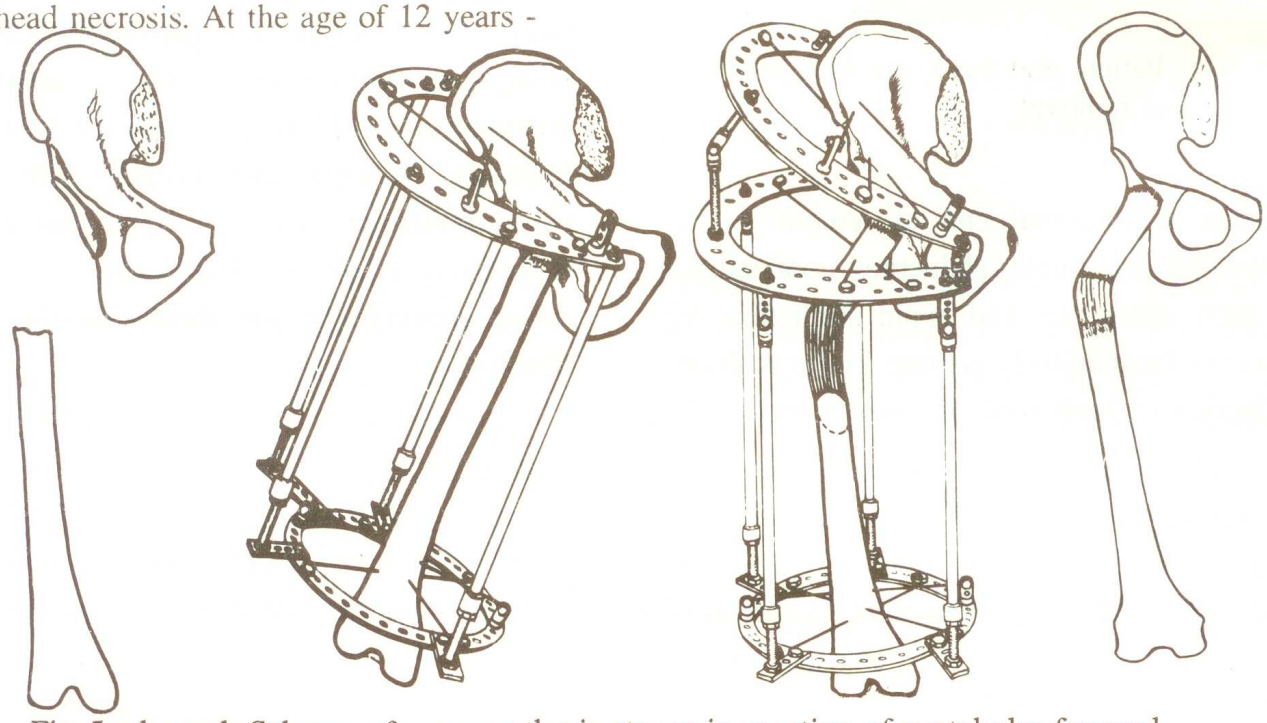


Fig 5a, b, c, d. Scheme of osteosynthesis stages in creation of acetabular-femoral synostosis with reconstractive elongation of the femur.

After the resection of the bone vedge from the acetabulum roof and the upper pole of proximal end of femoral bone compression arthrodesis by means of Ilizarov apparatus in the adduction position is performed. Fixation period is 42 days. After that corrective - elongating compactotomy on the boarder of the upper and middle femoral third with creation between angle fragments for widening of perineum space and elongation. The general period of treatment with apparatus - 154 days. After the period of 1 year and 2 months the functional length of both legs is equal, the position of operated limb is functionally profitable. In the area of the hip - joint bone ankylosis is observed. Started working in 5 months after apparatus removal.

Difficulties for reconstruction of limb supportability occurs in total defects of proximal end of the bone. This is provided by sharp non - correspondence of the bones /upper third of femoral diaphysis and widened flat acetabulum/, vivid bone atrophy and considerable diastasis between them, consolidation of proximal femoral end with surrounding scar tissues, and with the attempt of insertion into acetabulum leads to considerable crimping of the soft tissues, and sometimes makes obstacles between 11 tissues (fig.5a). For releasing of synostosis conditions and decreasing of limb shortening synosteoses is performed not in the conventional places of acetabulum, but in the lower parts and articular hole with iliac bone.

The reconstruction of the upper third of the femoral bone with the aim of widening of perineum space and elongation is performed simultaneously with synostosis or, in severe cases, the second stage, after gaining of iliac - femoral synostosis.

A.c. 4258263/28-14 The method of treatment of the defect of proximal femoral part. G.A.Ilizarov. Positive decision from 28.06.88.

The operation began with the preparation and coaptation of joint bones. Through the external longitudinal incision proximal end in the upper third of the femur proximal end of femoral bone is seen and decortication along 1,5 - 2 cm is performed. According to the incision in the lower part of acetabulum or along it vedge - shaped hole is formed, corresponding to the form of proximal end. The femur is in the position of adduction 140 - 130 degrees, proximal end of the femur is drown in this hole and temporary fixated by two Kirschner wires with pelvic bones. Through the crest and supraacetabulum area of iliac bone two cross wires are inserted in oblique sagittal direction, which is being fixated under tension to the apparatus arch, assembled under the angle 40 -50 degrees open medially to the cross section area of the pelvis. In the area of distal metaphysis of the femur 2 - 3 wires are inserted, which are fixated under tension to the ring (fig.5b).

Apparatus supports are connected by 4 threaded rods, compression is created between the synostosis bones. After consolidation and simultaneously with synostosis reconstruction of the upper third of the femur is performed, 2-3 additional wires are inserted under tension to the arch, assembled 5-7 cm.lower the proximal plate of the pelvic cross section. On the border of the upper and middle third of the femoral bone compactotomy is performed. Distal fragment is abducted medially to 40 - 45 degrees after that distal arch and ring is connected by 4 distraction rods (fig.5c). Beginning from the 5 - 6th days of distraction gradual distraction is performed between the fragments by 1 mm per day up to correction of the functional length of the legs (fig.5d)

Clinical observation.

Patient P.30 years old, medical report 12078, was admitted to the hospital with diagnosis: proximal

end of left femur defect - 21 cm. When she was 19 years old tumor resection of the proximal end of the femur was performed and defect was substituted by bone allograft.

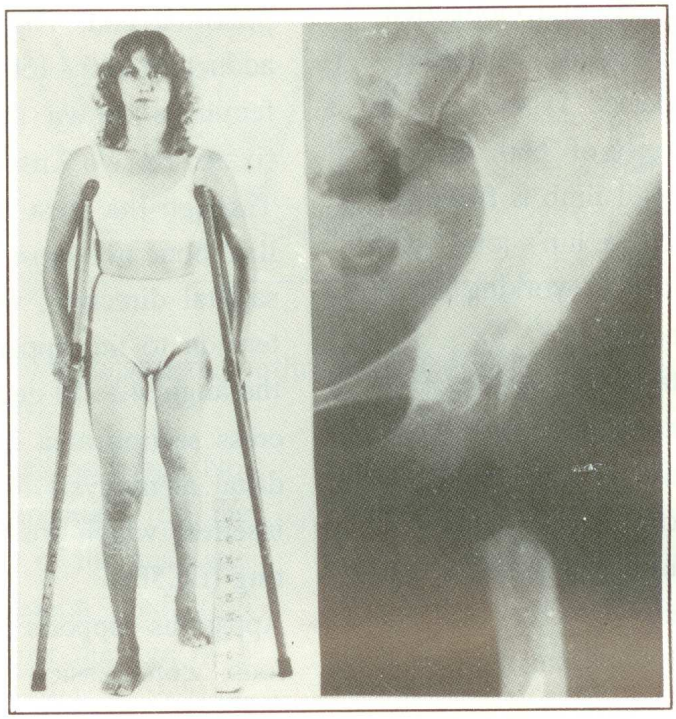


Fig 6a, b. Patient and X-ray on admission

In 1975 allograft was changed by Zatsepin endograft, which was removed in 2 years because of purulent process (fig.6b). On admittance - complaints on unsupportability of the left leg,shortening, pains in left hip - joint. Left lir is flailing, in the upper third of the fem pathological movability in every direction observed.

Fig 7a, b, c. Patient and X-ray during osteosynthesis process

03.11.83 open compression arthrodesis is performed in the area of lower part of acetabulum in adduction position of 140 degrees (fig.7a). Fixation by Ilizarov apparatus - 70 days. 17.01.84 - reconstruction of the upper tibial third for widening of perineum space, improvement of femoral configuration and elongation (fig.7b). Result after 1 year: walking without any additional supports, slightly limping, the limb is supportable, functional length of the legs is equal (fig. 8 a,b,c). Patient B., 31 years old, medical report 3612, was admitted to the hospital on 21.02.73 with diagnosis: defect of the proximal end of left femur - 16 cm,chronicle osteomyelitis. Defect appeared after alloplastics, complicated by osteomyelitis of the proximal end of the left femur in 1964. On admittance the patient complained to unsupportability of the left leg, shortening, pain in the area of the hip - joint (fig.9).

In the upper third of the femur pathological flailing is determined, the leg is unsupportable. On the X-ray the total defect of the proximal end of the femoral bone up to the level of the upper third of diaphysis, acetabulum is damaged and flat (fig.9b). The patient was operated by the same method. Result was observed during 4 years. The limb is supportable, walk without any additional means of support, slightly limping.

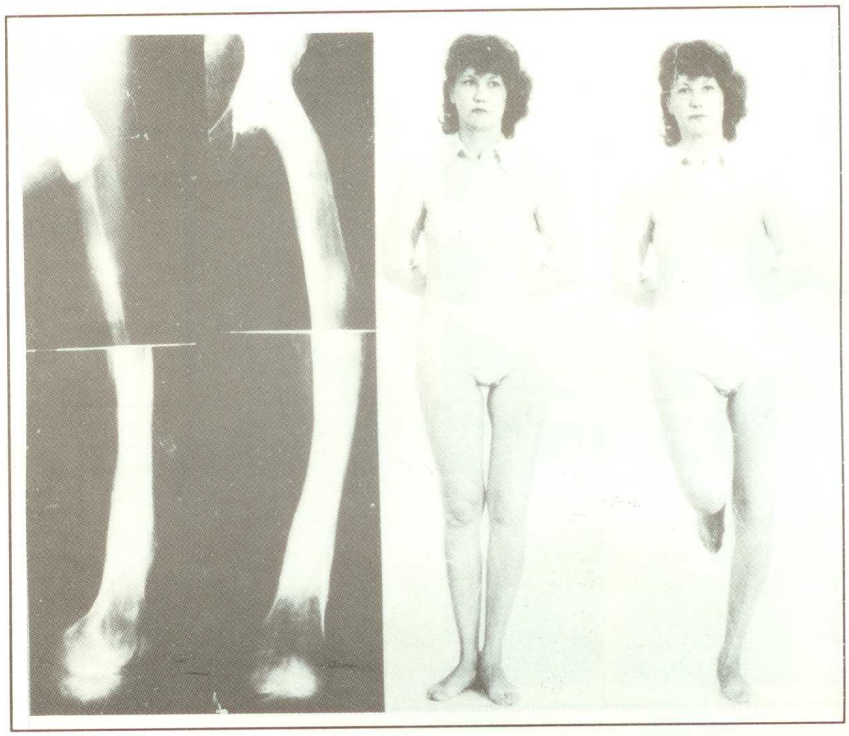


Fig 8a, b, c. Patients and X-ray in 1 year after the apparatus removal

She is satisfied with treatment results.

Thus, reconstructive - stabilizing operations, elaborated by academician Ilizarov allow to perform full rehabilitation of the patients with defects of the femoral proximal end. Reconstruction of the upper third of the femur is performed with restoration of supportability and limb length.

This operations are advantageous for fema patients. Perineum space widening provides equ loading of both extremities,profitable for g improvement and consider the peculiarities genital and other physiological functions of t woman, improves cosmetic result of treatment.

Fig 9a, b. Patient and X-ray before surgery

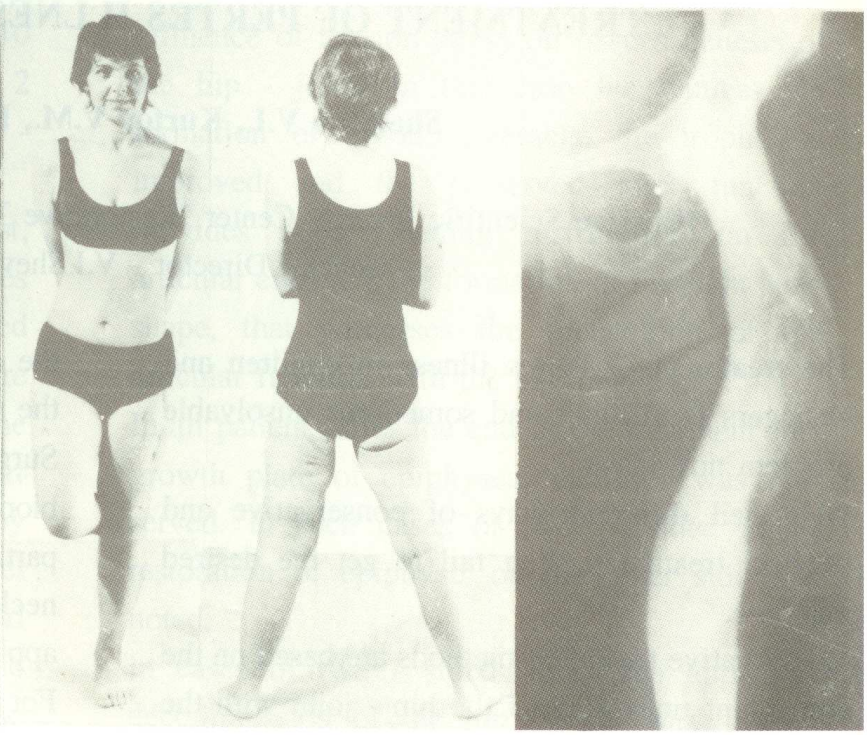


Fig 10a, b, c. Patient and X-ray in 4 years after the apparatus removal

TREATMENT OF PERTES ILLNESS AFTER ILIZAROV

Shevtsov V.I., Kurtov V.M., Karasiova T.Y.

(Russian Scientific Ilizarov Center "Restorative Traumatology and Orthopaedics";
General Director - V.I.Shevtsov, M.D.)

The treatment of Pertes illness in children and teenagers is difficult and sometimes unsolvable problem nowadays.

Suggested different ways of conservative and surgical treatment often fail to get the desired outcome.

Conservative treatment methods are based on the permanent unloading of the hip - joint with the help of tourniquet loaded traction of femur and tibia. But long period of staying in bed in case of tourniquet traction leads to hypodynamic, limb muscles atrophy and in sone cases, especially in children and teenagers, allow to get true unloading of the hip - joint. As a result, after conservative treatment residual deformations of the head are noted, hypoplasia of acetabulum, that could be the course of coxarthrosis later on. Fixation unloading apparatuses, used for decompression of the hip - joint by the leg weight, do not provide permanent decompression of the hip - joint, decrease the pelvic muscles tension, that leads to the development of residual deformation of the femoral neck, making longer the period of treatment.

Suggested surgical methods, by means of different ways of osteotomies of proximal part of femoral bone and allow to improve the blood - supply of the joint and to prolong the trophic effect of the action due to regenerate in sub- and intratrochanteric area and do not allow to gain the decompression of the hip - joint and restore the shape of femoral head.

Surgeries used and aimed at increasing of the blood - supply of the hip - joint, and, in particular, nailing, tunnelization of the femoral neck and head also did not meet vast clinical application.

For the above - mentioned conservative and surgical treatment methods obligatory joint immobilization without function is indicated. As a result, restorative processes in the damaged joints is too prolonged and frequently unsuccessful.

The application of distractional - hinge apparatuses for the treatment of patients with pertes disease allowed some authors (E.S.Tikhonenkov, Y.I.Pozovsky, 1987) to gain the unloading of hip - joint with elimination of muscles compression. In this case, the unloading of the hip - joint in longitudinal direction does not include pressure on the internal and lower parts of acetabulum, that leads in its turn to the partial restoration of the head epiphysis and does not provide its right orientation.

In Russian Kurgan Scientific Center we elaborated the method of treatment of Pertes disease, providing decompression of the hip - joint with the help of Ilizarov apparatus with active functional loading (A.c. 1561245 G.A.Ilizarov, 1978., DCP).

The method were used in treatment of 10 patients aged from 5 to 15 years: 8 boys and 2 girls. One - sided injury was in 5 patients, two - sided in 5 patients.

The method was performed through the crest, supraacetabulum area of iliac bone 3-4 wires were inserted on different levels in crossed position in the opposite direction. The wires were fixed to the arch support under the pressure. The wires were fixated to the ring apparatus support under pressure. Supports were connected by distractional rods with hinges nods, on the level of the level of rotation center of the femoral head considering its following restoration and volume increasing. After the apparatus assembly the distraction between the arch and ring supports to the direction to the femoral neck axis was performed up to reposition of the center of the femoral head (considering the proposed restoration) with the acetabulum center.

On the second day after osteosynthesis the patients started walking with gradual loading of the limb. They made exercise therapy of knee - and ankle - joints and active-passive movements in the hip - joint with preservation of given decompression force. Supportive distraction for decompression of the hip - joint was made once in 10-14 days. Control roentgenography was made once a month. Medical therapy was not used.

In all patients in 1 - 1,5 months of the active - passive decompression of the hip - joint with functional loading of the limb equal restoration of the epiphysial cartilage was noted, with increasing of its height and restoration of the head shape of the femoral bone. Rapid regression of pathologically changed parts and restoration of the femoral head shape we connect with stimulating influence of tension stress on tissues genesis of the hip - joint. In this case we witness the formation of blood - vessels, the trophic is improved and the preserved joint function provides equal loading distribution on the articular ends and the formation of the right head shape, that witnesses the preposition of the articular function with the late loading.

In all patients after the end of the treatment the growth plate of epiphyseal cartilage was preserved. In such cases of two - sided injury restoration of epiphysis on the other side was noted.

In cases of two - sided injury the apparatus decompression of the hip - joint was applied from the side of the most vivid pathological changes in the hip - joint. It was noted that the active influence on the zone of the pathological focus of one joint led to the vivid activization of restorative process of the other hip - joint.

The average fixation periods was 3 - 3,5 months. After the apparatus removal the patients were allowed to increase the loading gradually with the help of the crutches. The general period of treatment including the walking with full loading is 1 - 1,5 years.

Thus, the treatment after Ilizarov of Pertes disease allows to perform the guided correction of restoration of epiphyseal cartilage of femoral neck, providing the right orientation of the growth plate.

CONCLUSIONS:

1. The suggested method appears to be less traumatic and high-effective for treatment of Pertes disease in children and teenagers.

2. Equal distribution of static and dynamic forces on the hip - joint, caused from the one side by the distractional apparatus forces, and from the other - by active muscles contraction of the limb with exclusion of the pressure by injured head of the femur on the internal lower parts of acetabulum, providing the right orientation of the growth plate of epiphyseal cartilage in the process of restoration of the femoral head shape, prevents the development of the secondary deformation of the femoral head,valgus deformation of the neck and the development of instability of the hip - joint.

3. Decompression of the hip - joint in biomechanical optimal direction with stimulating influence of tension stress on tissues genesis allow to support the full muscles balance, surrounding the hip - joint, with simultaneous equal stretching of the articular capsule and improving the anatomic interrelations in the hip - joint.

4. Functional loading of the limb with preservation of hip - joint decompression provides active muscles contraction, that leads to the increasing of blood - circulation in the hip - joint area, accelerates the dissolving of necrotic tissues and activates the restorative processes not only in the femoral head, but also in the neck and acetabulum.

5. Simplicity, accessibility, hopeful outcomes of treatment method allow to recommend it for the wide application of this method in the clinical practice.

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CONTROLLED TRANSOSSEOUS OSTEOSYNTHESIS WITH ILIZAROV APPARATUS FOR MULTIPLE PSEUDARTHROSES OF LONG BONES

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Management of multiple pseudarthroses in ong bones is a difficult task for restorative surgery, since it calls for a number of traumatic interventions comprising fragment reposition, application of various intra-extramedullary metal fixators independently or in combination with free bone grafting. However, such treatment do not always guarantee successful osteosynthesis and complete rehabilitation. Chronic infection in pseudarthrotic area often extends treatment time.

In 1951 G.A.Ilizarov proposed his apparatus and brand new method to decrease surgical trauma and improve rehabilitation of patients with the said pathology. The method is based on controllability of plastic and regeneration tissue potential under stable fixation of bone fragments in the apparatus and stimulation by tension stress known in literature as the "Ilizarov effect"

Ilizarov apparatus design with its crossrossing wires, from the mechanical standpoint, rovides better fixation in terms of rigidity and alance in comparison with other apparatuses ith monoplane wires or half-pins fixed either to rched fulcrums or to monolateral longitudinal ames. Such constructions being to a certain xtent springy do not ensure stable fixation of one fragments, therefore they often necessitate dditional means of fixation. Consequently, early mb loading is impossible in full value for a relatively long time. Construction peculiarities of Ilizarov apparatus allow to assembly its parts into various groups according to treatment and rehabilitative tasks. The apparatus allows to control in a closed manner fragment position in any type of pseudarthrosis management regardless of displacement and fracture type. With the use of compression, distraction or their combination surgeon is able to solve complex orthopaedic problems minimizing the number the number of treatment stages and amount of surgery.

Chronic osteomyelitis in remission or its weak form is not a contraindication against controlled transosseous osteosynthesis. Small sequestra in interfragmental gap are exterminated or restructured under compression stress that eliminates the need for sequestrectomy.

By the moment, the literature gives insufficient data demonstrating rehabilitation tactics for patients with multiple pseudarthroses in long bones. That's why we want to share our experience in the management of the said pathology with Ilizarov method of transosseous osteosynthesis on the basis of the discovered by him general biological regularities of reparative tissue regeneration.

We studied the results of rehabilitation in 53 patients with multiple location of pseudarthroses in long bones.

Of them 14 cases were female, 39 were male. The bulk of the patients were young workable people. Multiple pseudarthroses make 6% of all cases of the said pathology, according to our data.

Fifty three patients admitted for treatment had 107 pseudarthroses, 25 of them were in the upper third of one or more segments, 50 cases in the middle and 32 cases in the lower third of segment.

According to location of pseudarthroses the patients were distributed as follows: double tibial pseudarthroses - 6; triple ones - 1; in both forearm bones - 5; both tibial bones - 12; both tibiae - 7; both femurs - 1. Pseudarthroses of humerus and one of the forearm bones in one limb were in 4 patients, the ones in different limbs - in 3 patients. Combination of humeral and femoral pseudarthroses were in 3 cases and there were 2 cases of humeral and tibial pseudarthroses. In one patient pseudarthroses were in one of the forearm bones and in tibia. Pseudarthroses in femur and tibia at one side (5) and opposite sides (3) were in 8 patients.

Latency of pseudarthroses was from 6 months to 8 years; in the majority of cases (38) it exceeded 2 years. In 36 patients multiple pseudarthroses appeared after open fractures while in 17 cases they appeared after closed fractures or intervention in bones. Thirty six patients had been operated elsewhere before admission to our clinic, 32 of them were operated with the usage of various metal fixators and bone plastics independently or in combination. After multiple attempts to eliminate pseudarthroses and osteomyelitic process half of the patients were proposed to amputate limb.

Pseudarthroses were aggravated wi trophic ulcers (10 cases), eczema (1), extens skin scars (50), anatomic limb shorten (35),different types of fragment displacem (38), contractures and ankyloses of adjacent joi (43). Twenty eight patients had broken forei bodies in pseudarthrotic area (metal rods, plat allograft, wires). In 24 cases pseudarthroses wa complicated with weak chronic osteomyelitis.

Thirteen patients used canes or crutch for walking. Thirty patients had additional me for fragment fixation (cast - 13 cases, orthopae devices - 17 cases). Five patients couldn't w without additional help.

Variability and severity of the pathol were the reasons for persistent disability.

Methodology should be taken i consideration when viewing the problem multiple pseudarthroses from the standpoint controlled transosseous osteosynthesis. following issues are solved during rehabilitat of patients with the said pathology:

- elaboration of feasible treatment tactics, cho of type and sequence of osteosynthesis;
- technical performance of osteosynthesis w correct choice of frame assemblies dur treatment;
- forecast of treatment time depending duration of the problem;
- determination of the amount of preoperat preparation of patient consider aggravating factors;
- post-operative management.

Preoperative preparation for cases multiple pseudarthroses in one or two upper segments is made according to general rules

Treatment is generally performed on the ut-patient basis and patients remain at home oing to clinic for fragment fixation checks and dressing. Being with the family patient lives his ormal life that has a positive effect on his state.

Highly stable fragment fixation for steosynthesis of humerus and forearm bones ables men to do farming (driving tractors, ding horse, etc.) and women to run household ooking, domestic animal care, milking cows, c.).

Osteosynthesis for pseudarthroses of both rearm bones is especially interesting since rgeon encounters a number of non-standard tuations. Osteosynthesis is quite easy when both eudarthroses are at the same level and fragment ds are cross-cut. That calls for monolocal teosynthesis with longitudinal compression and rresponding Ilizarov apparatus assembly.

The task is more difficult when fragments one bone are cross-cut and fragments of the her are oblique. In such cases osteosynthesis is ade with longitudinal compression in one bone d side-to-side compression in the other one. ree wires are driven through metaphyseal areas basic rings and at the ends of fragments the res are driven in such a way as to provide dependent manipulation with each bone.

Even more complex case is when there is lislocation in one of radioulnar joints, persis- t pronation and shortening of one bone. Such ation demands several consecutive stages.

First, an apparatus is applied to correct gular and rotational deformities and to set the es. After the segment axis is corrected and es are set a defect in one of the bones comes apparent. At the final stage of osteosynthesis bone fragments are fixed and defect of the second bone is filled.

In pseudarthroses of both segments of the lower limbs patients should be prepared for active motion after frame application since many patients follow the tradition and "tune" themselves to postoperative bed rest. This group of patients needs constant care before treatment. The lack of active motion affects their morale due to physical disability. That's why a great deal of attention should be paid preoperatively to motion control, positive attitude and assurance in the final result. We recommend everyday physical therapy with instructor like change position in bed, active an passive articular motion, soft tissue massage.

Small trauma caused by transosseous osteosynthesis allow to use it, as a rule, simultaneously for multiple pseudarthroses in one and/or different segments. In the last case according to patient's wish osteosynthesis can be made consecutively i.e. initially the apparatus is applied to one segment and after the patient gets used to the frame and active articulation is restored apparatus is applied to another segment. Using the technology of controlled transosseous osteosynthesis the following complex of treatment tasks should be solved: 1.Restoration of bone integrity. 2.Restoration of limb length. 3.Elimination of osteomyelitis. 4.Correction of anatomic and functional changes and disorders.

A special care should be given to correct choice of frame assembly providing permanent and rigid fixation of bone fragments throughout treatment period.

Bloodless treatment was used in 38 patients without large sequestra and foreign bodies, with congruent fragment ends and

sufficient contact area for longitudinal, side-to-side compression or their combination. In such cases closed monolocal compressional osteosynthesis was applied (51).

Indications for closed monolocal distractional osteosynthesis were hyperplastic pseudarthroses (6) with stiff, "springy" pathological mobility and anatomical shortening under 5 cm.

In cases when pseudarthroses were accompanied with fixed angular deformity of bone fragments (19) caused by monolocal wedge-shaped bone defect a closed monolocal combined compression-distractional osteosynthesis was used.

Most frequently (11) in such cases a method of directed horizontal traction was applied when the main correcting force was driven against the deformity apex close to fragment ends and auxiliary force was applied through distraction at the rods of the frame. Segment deformities were corrected in 7 cases by traction of the additional rings with crossing wires driven close to deformity apex transported perpendicularly to biomechanical axis of limb, in 3 cases - by tightening wires with stoppers and in one case - by tightening a bent wire. The basic principle for reposition was biomechanical centering of the distal fragment to the proximal one. In 15 cases with pseudarthrosis and incongruent fragment ends, large sequestra and fragment shortening over 5 cm, fragment ends were openly realigned and the longer fragment was osteotomized for further lengthening.

Function of the adjacent joints, specifically knee or elbow in 12 patients was recovered employing hinges assembled of standard parts fixed trough rods to the main frame including additional ring with wires on the distal fragment. For mild equinus position of foot elastic ba were used in 8 cases and 18 cases with persis contractures and foot deformities were trea with the corresponding frame assembly thro skeletal traction of metatarsal bones. Du treatment all the patients underwent a cours motion therapy and physioprocedures on artic area.

Stable fixation of bone fragments in fr from the first days enabled the patients to self-service, make active and passive artic exercises and put loading on limb that impro trophicity, eliminated articular stiffness consequently favored prompt rehabilitation.

Tactical principles of osteosynthesis multiple pseudarthroses in one segment (femu tibia) are hardly different from those for sing pseudarthroses. However, the apparatus assen must ensure independent systems between b rings for osteosynthesis at non-union a (pseudarthroses). Shape of fragment ends, typ callus formation and supposed amount rehabilitative measures influence the choic "subsystems" for compression, distraction or t combination and the type of osteosynthes open or closed. The status of the second of paired bone - its deformity, integrity, alignm in joints - is also important.

A clinical example (fig.1).

Patient M., 39 years old was admitte the clinic for multiple (triple) pseudarthrosi the left tibia. Three years earlier he ha multiple fracture of his left tibia in a accident. Bone plates and intramedullary plastics with cast had been applied. No conso tion occurred, pseudarthroses appeared. He c walk only with crutches and detachable splint as fixator.

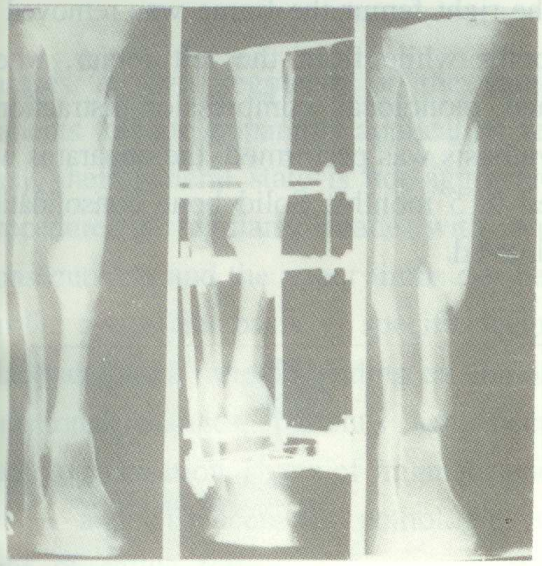

Fig 1. X-rays of patient M.: left - before treatment; middle - during osteosynthesis, right - 2 years after treatment

Clinically and roentgenologically there was pathological "springy" mobility in mid-tibia and locking plates at the ends of fragments.

Ilizarov apparatus of four rings was applied in a closed manner with crossing wires driven through each tibial fragment. Stable fixation and sustaining compression at the fragment junctions were performed for 5 months, 4 of them - on the out-patient basis. Complete consolidation, articular function and supportability were stated after apparatus removal.

Follow-up in two years demonstrated no recurrence of pseudarthroses.

In diaphyseal pseudarthroses of forearm bones at the same or different levels osteosynthesis is made in each of the bones, though basic rings in metaphyseal regions are common for both bones.

Patients with pseudarthroses in the same segments of lower limbs are the hardest to cure.

Controlled transosseous osteosynthesis has certain advantages in such cases since it can be performed simultaneously in two segments and thus shorten rehabilitation process. Main tactical principles of osteosynthesis are largely determined by anatomic and functional features of the pathology. The basic requirement is application of frames with increased strength of bone fragment fixation to ensure functional treatment after surgery. Osteosynthesis in the same segment on both sides can be made either by one or two teams of surgeons. We prefer to work in two teams for the less time needed for procedure.

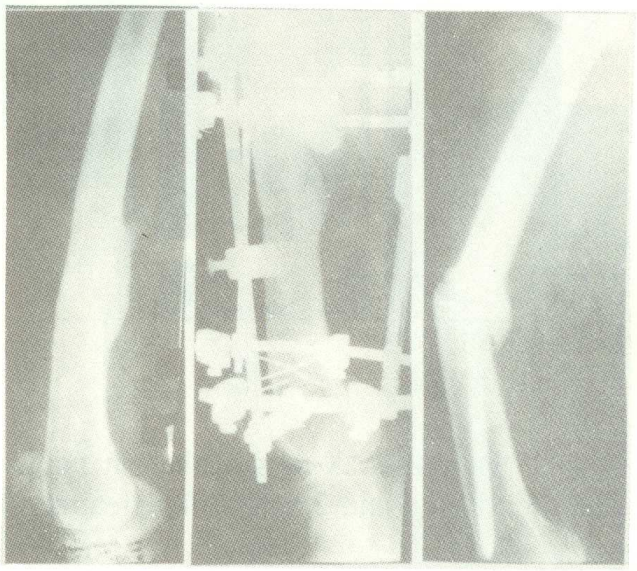

Fig 2a. Patient K. X-rays of the right femur (before, during and 2 years after the treatment)

Another clinical example (fig.2).

Patient K., 47 years old was admitted to the clinic for pseudarthroses of both humeri, persistent knee extension contracture. Trauma occurred 2 years earlier. Intramedullary osteosynthesis had been performed twice for fractures of femurs with further cast fixation for 8 months.On admission: the patient couldn't walk indepen-

&dently. She could stand for a while with crutches and additional support. There was valgus (10°) - antecurvatum (30°) in the right femur and varus (30°) in the left one. In the middle of both femurs there was stiff (5°) pathologic mobility. Range of motion in the right knee was 70° (180 - 110°) and 110° (+80 - 170°) in the left one.

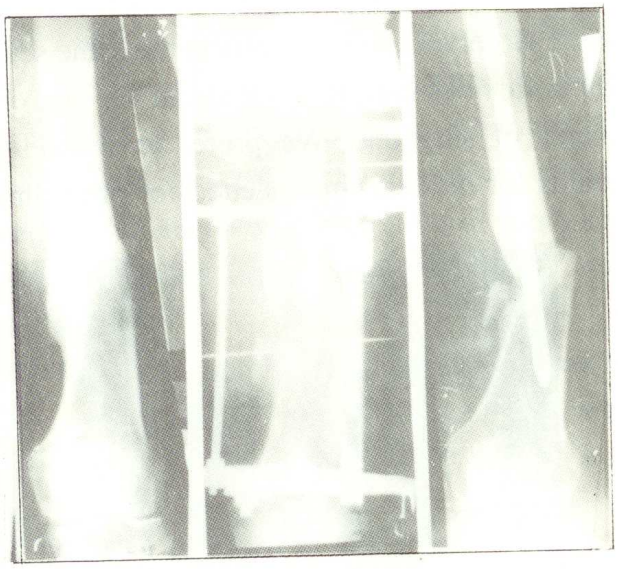

Fig 2b. Patient K. X-rays of the left femur (before, during and 2 years after treatment)

Roentgenogram cross-cut fragment ends with moderate femurs extension, metal rods in bone marrow canals of both femurs and inter-fragmental gap of 0,2-0,3 cm. The patient underwent concurrent closed osteosynthesis with Ilizarov frames for both femurs after removal of the rod from the left femur. The segmental deformities were gradually corrected within 13 days. From the first days she did active exercises and initially stood up 3 times a day. In two weeks she became completely ambulant with crutches and in 1,5 months - with two canes.

From the right femur the frame was removed 2,5 months while from the left femur, wh combined monolocal compression-distractio osteosynthesis was performed, the apparatus w removed in 5 months. Solid bone consolidati was achieved.

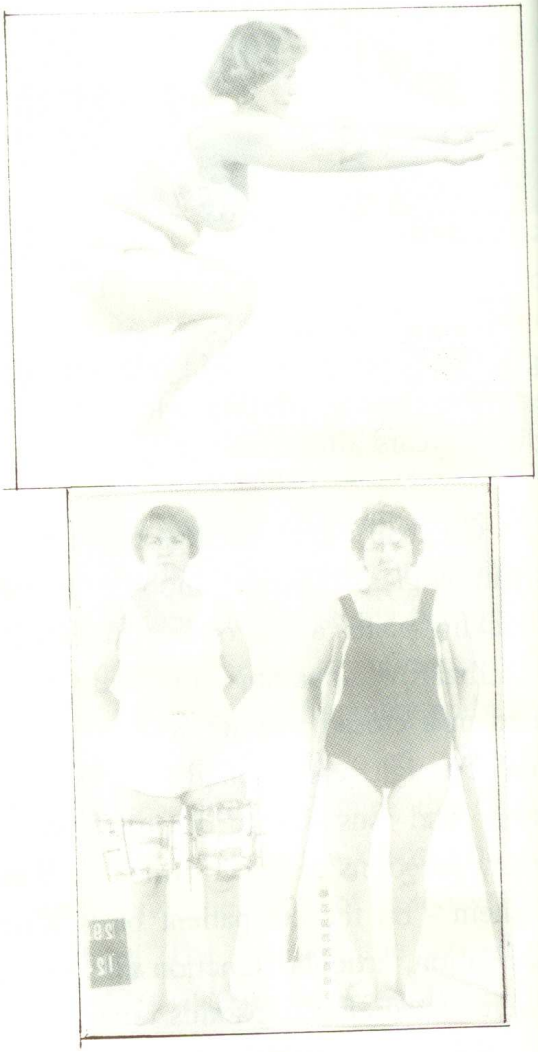

Fig 2c. Patient K. during treatment

Full ROM in the knee was restored wit a year. On a 3-year follow-up: no complaints, disability.

Small surgical trauma allows to perfo simultaneous osteosynthesis for multiple pseud

hroses in two segments of the same limb. Patients tolerate apparatus application relatively easy, their general state is not aggravated. The procedure is regularly made with one team consecutively and the upper limbs can be treated on the out-patient basis. A specific technique is elaborated each time depending on anatomic and functional changes, patient's age, occupation, pathology location, shape of fragment ends, their length and displacement, pathologic mobility, type of callus formation, presence of foreign bodies, state of soft tissue and accompanying trophic disorders.

This is shown by the next clinical example (fig.4).

Patient C., 35 years old was admitted for pseudarthroses in the lower right femur and upper right tibia. He had gotten an open right tibia fracture and closed right femur fracture in a road accident. Initial treatment had included primary surgical treatment of tibial wound, fragment fixation with a catgut thread and cast immobilization. Skeletal traction by femoral condyles had been kept for 40 days followed by cast fixation for 6 months. No consolidation had happened. Femoral and tibial osteosynthesis with Ilizarov apparatus had been made without consolidation.

On admission to our clinic the patient was ambulant with crutches without right leg weightbearing. Shortening of the right leg was 1 cm in the femur. There was 65° varus in the lower right femur with stiff pathologic mobility within 15° and valgus (150°)-recurvatum (170°) all in the same area.

Roentgenogram demonstrate cross-cut fragment ends of femoral fragments, unevenly opaque interfragmental gap of 0,2-0,3 cm; oblique-transverse ends of tibial fragments and interfragmental gap of 0,6-0,8 cm.

Fig 3. X-rays of Patient C. (left - before, middle - during treatment, right - the result in 3 years)

The patient underwent closed compressional osteosynthesis of the right femur and tibia with Ilizarov apparatus. Fixation in femur lasted for 90 days.

Deformity correction in tibia took 55 days, fixation lasted 180 days.

Fragment consolidation and limb supportability were reached.

On follow-up in 1 year and 2 months: no complaints, the patient is ambulant without crutches, no disability.

Remarkable is the fact that psychogenic disorders rapidly disappear in patients who had lost hope for recovery. This is explained by atmosphere of psychological trust, everyday activity (possibility of self-service) and expansion of contacts.

Average period of frame fixation made 127+-8 days for management of multiple pseudarthroses in one limb. For the patients with pseudarthroses of the same segments and different segments of the same or different limbs this time makes correspondingly 138, 143 and 155 days.

We encountered the following complications during treatment: mild pin tract infection (6 patients), aggravation of chronic osteomyelitis (1 patient), temporary paresis of peroneal nerve (1 patient). The complications were not severe, they were corrected during treatment and didn't have much effect upon its final result.

Analysis of close anatomic and functional outcomes demonstrated the following.

Bone fragment consolidation was reached in all 53 patients, purulent process was eliminated in 94,7%, function of the adjacent joints w restored in 46 patients and significantly improv in 7. Of 21 patients with 2-7 cm limb shortenin it was completely eliminated in 19 and in tw cases the amount of residual shortening was and 3 cm.

Long-term follow-up of 1 to 6 years we studied in 50 patients, of them 49 sustained t achieved level of rehabilitation and one patie had to undergo treatment for regenerate fractu that occurred after falling. Forty nine persons all studied are actually healthy and employed different spheres.

Positive anatomic and functional results the treatment demonstrate high efficacy controlled transosseous osteosynthesis wi Ilizarov apparatus for multiple pseudarthroses long bones.

Therefore, transosseous osteosynthesis h certain advantages before traditional surgic techniques for the treatment of multiple pseu arthroses of long bones in various combinatio These advantages are:

- concurrent controlled osteosynthesis th shortens treatment time;
- wide range of non-traumatic techniqu providing highly functional treatment allows simultaneously rehabilitate the patients;
- high efficacy of treatment and social rehabilit tion.

FIBULA TIBIALIZATION AFTER ILIZAROV IN PATIENTS WITH TIBIAL DEFECT.

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lowadays we have about 50 different kinds of perations for tibia - fibular synostosis described different modifications by our and overseas uthors, with some differences in the osteosynthes technique.

ritical analysis of traditional synostosis methods owed that favorable results as, for example, chievement of the support function is in 84,6% nly, but in this case the shortening and the other ccompanying functional disturbances are not iminated (S.P.Merkulov, 1970; V.V.Kuzmenko, .V.Ushakov, 1972). The majority of our and verseas authors consider that the keeping of the bula in contact with tibial fragments in case of iaphyseal of juxt-articular defect is of great roblem.

VKNC"VTO" clinic we use the methods of bia - fibular synostosing since 1969 ant at esent we have the data about the treatment sults in 46 patients, operated with application different variants of tibia - fibular synostosis. radual displacement of non - free bone fragents of the fibula with paraossal tissues for nostosing was made 2 - 4 times a day by 0,25 m per day and after the bone contact achieveent we performed supportive compression 1 a y 3 - 5 day.

he achievement of positive anatomic - funcnal results of treatment of tibial defects due to displacement of fibula was provided by the strict observation of the synostosing principles, stated in VKNC"VTO" (Ilizarov G.A.):

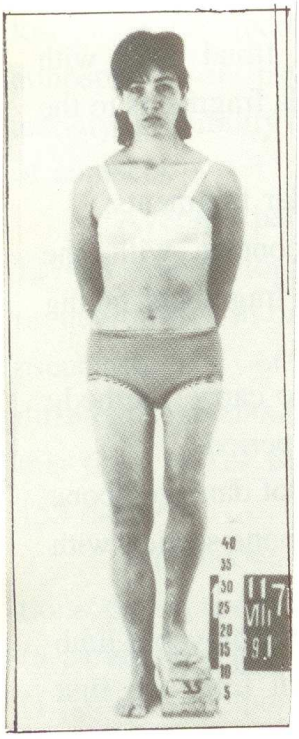
- creation of biomechanical tibial axis with maximum proximity of fibula fragments to the center of tibial section;
- gradual displacement of fibular fragments;
- achievement of reliable contact with the following stable fixation of the fragments, taking part in the synostosing process;
- creation of bone block, able to carry the body weight during the locomotion periods;
- preservation of blood - supply of damaged bone and limb, to perform splits and bone section with low traumatism;
- preservation of the support and movable limb function, mobility of the patient from the first days of treatment.

For systematization of clinical material concerning the character of methods of tibia - fibular synostosing we divided the patients into groups, united according to the tactical peculiarities and osteosynthesis technique.

The first group consisted of 8 patients with diaphyseal posttraumatic tibial defect in the middle third, with tibial shortening or 4cm - shortening. Fragments ends of the tibia in all cases were cone - shaped, in diastasis, as a rule, chains of small ossificated parts, not connected with the fragments ends were determined. Fibula was not thickened, tibial axis is not curved. In

plate of pelvic cross section. Through proximal and distal ends of femoral bone 2-3 cross wires are inserted, the upper are fixated in the tensed position to the arch and lower to the ring. The arches are connected by the rods, compression is performed by means of nuts screwing in the area of hip - joint.

Later on oblique compactotomy is performed on the boarder of the upper and middle third of diaphysis of femoral bone in frontal area. Distalend of the femur is abducted to 30 -3 degrees, performing between bone fragments th angle, open medially. Femur is elongated b gradual distraction to the level of functiona length of the legs. For illustration we present th following clinical observation.



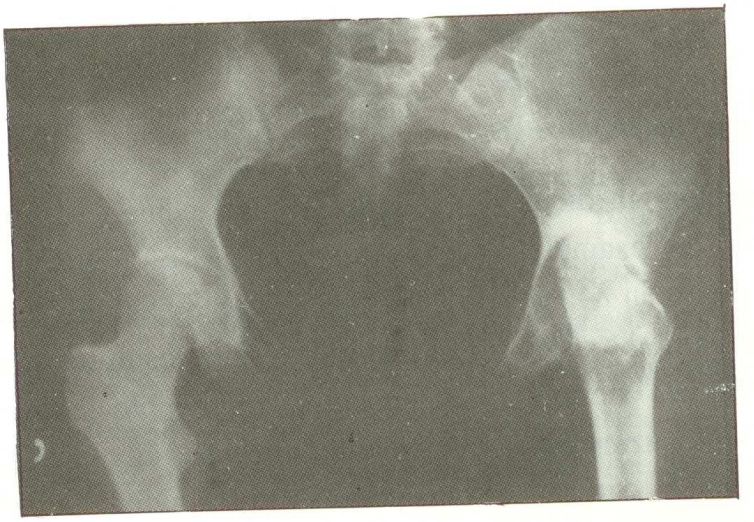


Fig 1 a,b. Patient and X-ray before treatment

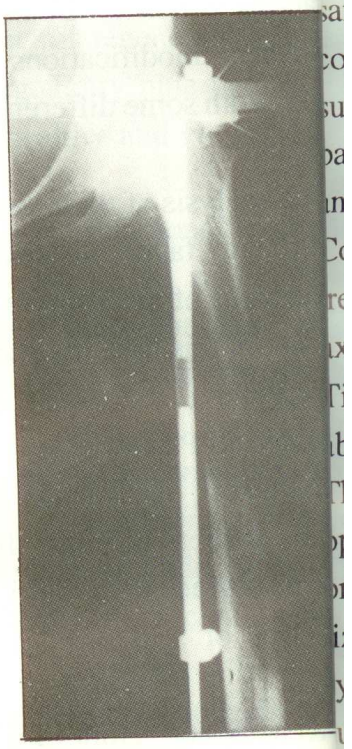


Fig 2 X-ray during th osteosynthesis process

Patient F., 26 years old, medical report No. 1731, diagnosis: defect of the head and neck of the left femur after tuberculosis coxitis, shortening of left lower limb - 13 cm. When she was 22 years old - operation - resection of the left hip - joint with the following arthroplastics (fig 1b). On admission the patient complained to the pain in the hip - joint, shortening of the left leg and vivid limping. Movements amplitude in the area of hi - joint was 30 degrees. The femur is shortene to 10 cm, tibia to 3 cm (fig 1a). Operation wa performed: closed compressional osteosynthesi of left hip - joint in the adduction position 12 degrees with simultaneous reconstruction proximal end of femoral bone with elongation t 9,5 cm (fig 2). Distraction period was 97 day

of bone callus is performed more actively, if all the necessary optimal biomechanical conditions are observed.

Tibialization of fibula leads to the decreasing of the distance between the section centers of the tibia, so the curve moment, influencing on the fibula also decreasing. In this fact the advantage of the tibialization of fibula is concluded . Our data agree with the theoretical investigations. M.C.Kukhtyak and N.L.Gaidash (1971). Original elaborations of the methods of tibia - fibular synostosing were accepted in different variants like inventions (G.A.Ilizarov, 1978; G.A.Ilizarov, V.D.Makushin, 1983).

Thus, we should note that because of t elaborated in VKNC"VTO" basic principles plastic surgery, the surgeon acquired ne different methods of effective and reliab restorative therapy of such complicated diseas as tibial defect, without skin and free bo grafting. Operation of tibia - fibular synostosi transformed to the operation of choice.

FIRST EXPERIENCE WITH POLIO PATIENTS TREATMENT USING THE ILIZAROV TECHNIQUE IN DR.ZIAUDDIN HOSPITAL, KARACHI, PAKISTAN.

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Since March 1993 Mondial Ilizarov Quintessence Research Association (M.I.Q.R.A.) started surgical work in Pakistan. Thanks to continuous and hard efforts of Dr. Ahmad Zafar Rech and Prof.V. I.Shevtsov, M.I.Q.R.A. brought orthopaedic team from the Ilizarov Kurgan Scientific Center (Russia) to work in Karachi. First surgery was performed here personally by Pprof.V.I.Shevtsov.

The peculiarity of orthopaedic pathology in Pakistan is the tremendous quantity of severe polio. Our 9 month practice shows more than 82% polio cases of all cases examined.

During this period 74 polio patients were operated. Among them 13 were operated twice. All suffered from different polio sequences in the lower limbs. At the beginning of work (1st team of Kurgan surgeons) treatment was planed in certain steps for each patient. As a rule for the first step the initial treatment was close reduction of joint contracture and elongation of the shortened limb. Later (2nd team) 2 or 3 surgerieswere performed with each patient at once. This made patients stand up and walk within days after surgery. During treatment they start rehabilitation still wearing the Ilizarov device. Such practice allows to reduce the recovery time and reach good treatment and psychotherapeutic results.

Stabilizing and corrective foot surgeries were combined with elongation and deformity correction in femur and tibia (depending on muscle status and presence of shortening and deformations). Also muscle transfer was performed if required. Both lower limbs were operated in 3 patients. After apparatus removal plastic cast was applied for 2-3 weeks in 11 patients. At present treatment is finished with 12 patients and 62 still are in rehabilitation process. The average treatment time in Ilizarov frame was less then 2 months (depending on elongation) ...