material. Our results indicate that when using a suitable transport material and latency period, the presence of the periosteum is not necessary for distraction osteogenesis.

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Интерактивная база данных лечения по Илизарову и профилактика осложнений

Ilizarov interactive database and complications prevention

Для всестороннего анализа более 200 операций по Илизарову разработана интерактивная многотабличная база данных в системе Windows. В качестве инструмента разработки используется MS Access. Все данные собраны в 67 основных и справочных таблицах, представляющих имеющуюся информацию через более чем 80 экранных форм, регулируемыми 43 исполнительными макроопределениями.
Интерфейс базы данных похож на существующие карты пациентов и разделен на несколько частей, включающих: общую информацию, обследование, диагноз, предоперационное планирование, операцию по Илизарову, послеоперационное ведение и осложнения.
Каждая часть базы данных связана с соответствующим комплексом рентгенограмм, диаграмм, фотографий и видеоматериалами пациента.
Входящая информация может быть автоматически проанализирована для каждого индивидуального пациента или для группы пациентов и восстановлена в качестве текстового резюме, таблиц или графически. Лечебный протокол, манипуляции с аппаратом и расчеты планируется представить с разработанной ранее системой предоперационного планирования с помощью компьютера "Leg Perfect".
Система позволяет клиницистам вводить данные непосредственно в базу данных, заполняя существующие формы или непосредственно диктуя на любой подсоединенный терминал. Пользование паролем ограничивает доступ к подобной деликатной информации о пациенте.

Worldwide acceptance of the Ilizarov method attracts more and more surgeons to use it for limb lengthening and reconstructive surgery, but the high rate of complications remains to be a major problem especially among young orthopedists. Frequency of complications gradually diminishes as surgeons gain experience with the technique. Multi-factorial analysis and systematic approach to the accumulated information about Ilizarov patients will help to avoid numerous complications and increase efficiency of learning curve.
Several attempts to perform such analysis by collection information in databases were unsuccessful due to the difficulties with the DOS operated database management. We started development of our first Computer Dialog Consulting System in 1989 in Ilizarov Center in Kurgan.
A number of factors are important for the satisfactory application of any orthopaedic technique and Ilizarov method particularly: including preoperative analysis of the limb condition, construction of external frame in such a way to mimic the initial deformity, and detemination of the proper parameters of frame manipulation (duration of latency period, rate and rhythm of distraction, etc.). Routine usage of this technique can be very complex, especially in cases with severe multisegmental three-dimensional deformities associated with leg length discrepancy. Due to the nature of the technique the treatment protocol requires not only general data collection but also description and an extensive analysis of very dynamic process of three-dimensional bone fragments transportation. Moreover, deformity correction in some cases consists of multiple stages and several frame adjustments are necessary during the treatment. As a result a large amount of additional written information along with radiographs, diagrams and calculations has to be placed in the patient chart on the everyday basis. To intensely analyze Ilizarov cases such textual and graphic information needs to be somehow organized.
In order to perform a comprehensive analysis of more than 200 Ilizarov procedures we developed an interactive multimedia database running under Windows environment. We use MS Access as a development tool. All data is collected in 67 main and reference related tables representing available information through more than 80 screen forms controlled by 43 executable macros.
Database interface Is similar to the existing patient charts and divided on several parts Including: general information, examination, diagnosis, preoperative planning, Ilizarov surgery, postoperative care, and complications.
Each part of the database is linked to the set of related images representing radiographs, diagrams, photos, and videos of the patient.
Entered information can be automatically analyzed for each individual patient or for a group of the patients, and retrieved as text summaries, tables, and graphs. Treatment protocol, frame manipulations, and calculations are planning to be performed with developed earlier computer assisted preoperative planning program "Leg Perfect®".
The system encourages clinicians to enter data directly into database by filling existing forms or by direct dictating to any connected terminal. The use of passwords restricts access to such sensitive patient information to only those who are authorized.
This online shared patient record system promotes collaboration and communication among clinical departments and research personnel, and may serve as a prototype for developing a structural and functional model of an online medical record for other orthopaedic patients. Because of multimedia nature the database can be also used as an effective vehicle for delivering clinical practice guidelines, and as an universal tool for teaching and learning the Ilizarov method.
Database was placed in the local hospital network connecting all doctor offices with Ilizarov clinic and all other departments involved in the treatment of the Ilizarov patients. All data were protected by access rights allowing the information to be viewed from any connected workstation but changed only from related department workstation.
The multi-factorial analysis of more than 200 Ilizarov procedures using interactive multimedia database will summarize our knowledge regarding overall results and complications. The systematic approach to the accumulated and new data will interactively guide a surgeon to optimize treatment planning, correct deviations during the treatment, and avoid possible mistakes and complications. Because of multimedia nature the database can be also used as universal tool for teaching the Ilizarov method and cases uresentations.

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Патологические переломы, сопровождающие удлинение конечности

Pathological fractures following bone lengthening

С 1985 года в нашем отделении было выполнено 195 удлинений конечностей с помощью аппарата и принципов Илизарова:
После операции наблюдалось 13 переломов — 7% случаев. Перелом бедра был отмечен в 8/87 случаях (10%); голень — в 3/92 случаях (3,2%) и плечо — в 1/16 (6,2%). В большинстве случаев переломы имели место при больших регенератах (более 7 см). Они наблюдались в раннем периоде после снятия аппарата (35%), в течение 3 месяцев (60%), и позднее (между 3 и 15 месяцами) - 5%. Переломы имели место в равной мере как при врожденной, так и при другой патологии. Хотя, менее всего их было при ахондроплазии (2 случая).
Лечение включает:

- повязка на 45 дней при инфлексионных переломах после небольшой репозиции (на 45 дней);
- остеосинтез по ESIN (эластичное стабильное интрамедуллярное введение стержней) при поперечном переломе бедра;
- наложение аппарата для дистракции при переломе со смещением фрагментов.

Мы подтверждаем эффективность метода ESIN флюороскопическим контролем при нестабильном поперечном переломе бедра.

195 limb lengthenings were performed in our Department since 1985 with the Ilizarov device and principles :
Femur : 87 cases - average gain 8,5 cm (ranging from 4 to 15 cm) Tibia : 92 cases - average gain 7,3 cm (ranging from 3 to 15 cm) Humerus 16 cases - average gain 9 cm (ranging from 8 to 10 cm) 13 fractures were observed after surgery, i.e. 7 % of cases. Indications for lenthening were lower limb congenital (17 fibular hemimelias, 5 phocomelias and congenital coxa-vara, 26 short statures among them 12 achondroplasias), post-infectious (16) or post- trauma epiphysiodesis and malunion (58).
upper limb 16 humerus : congenital humerus varus (3), achondroplasia (8), post-infectious (4) and bone cyst (I).

The femur was involved in 8/87 cases (10 %) tibia in 3/92 (3,2 %) and humerus in 1/16 (6,2 %). Fractures occurred preferentially for large gains (over 7 cm). They were observed after apparatus removal early (35 %), within 3 months (60 %), late (between 3 and 15 months) 5 %. They occurred at equivalent rates in congenital and other etiologies. However, they occur less in achondroplasia (2 cases).
Anatomically 3 categories were individualized:
1) regenerate inflexion, after moderated healing with conservative treatment (early cases : 4 cases)
2) transversal fracture with angulation ; fracture occurred at mid regenerate or at one of its extremities (femur 6 cases). This type is very unstable.
3) overlapping fracture (3 cases) which can result in loosing the all gain. Treatment included :

- cast for 45 days for inflexion fractures after gentle realignment (for 45 days)
- osteosynthesis by ESIN (Elastic Stable Intramedullary Nailing) in transverse femoral fracture.
- apparatus implantation with distraction in overlapping fractures. We are pointing out the effectiveness of ESIN under fluoroscopic control in unstable transversal fracture of femur.