Abstract: Knee Arthrodesis and Simultaneous Leg Lengthening Using the Ilizarov Method

Presenting Author: S. Robert Rozbruch, MD; Hospital for Special Surgery
Co-authors: Arkady Blyakher, MD; David L. Helfet, MD; Russell F. Warren, MD (*Hospital for Special Surgery,* all)

What was the question?
Arthrodesis of the knee is a salvage procedure that is typically done in young patients with a destroyed knee joint with bone loss and infection. Arthrodesis in the setting of significant bone loss results in unacceptable limb shortening. The presence or history of infection also makes internal fixation less desirable. The purpose of this study was to determine if knee arthrodesis and simultaneous lengthening using the Ilizarov method is successful.

Howdid you answer the question?
Four consecutive patients who underwent knee arthrodesis and simultaneous leg lengthening using the Ilizarov method and frame were prospectively followed. The average age was 39 and all were patients were male. All 3 patients had a history of trauma and subsequent osteomyelitis. Bone defects were present in 3 patients- 12 cm, 5.3 cm, and 2 cm. The average interval from the index trauma to the knee arthrodesis was 2.9 years, and these patients had an average of 9.5 previous surgeries. In 3 patients, monofocal lengthening was done in the tibia; in 1 patient, bifocal lengthening was done in the tibia and femur. These patients underwent an average of 4 procedures during this treatment. One patient underwent a planned bone grafting at the knee arthrodesis docking site. All 4 patients received 6 weeks of intravenous antibiotics. Full weight bearing, as tolerated, was encouraged during the entire treatment. Clinical and radiographic parameters were assessed. Modems lower limb module score and SF-36 scores were measured.

What are the results?
Leg length discrepancy improved from 6.5 cm to 1.6 cm. The mean lengthening done was 5.5 cm (2.5 Ð 11.5 cm). Mechanical axis deviation improved from 27 mm medial to 1 mm lateral to center of the knee. Femorotibial angle improved from 4.1° varus to 4.2° valgus. Bony union of the knee arthrodesis and lengthening regenerate occurred in all 4 cases, and the average time in the frame was 9.2 months. There were no recurrences of infection. Complications included superficial pin tract infections in all 4 cases that responded well to oral antibiotics. The Modems lower limb module score improved from 35 to 67.4. The SF-36 scores improved in all 8 categories and the average score improved from 11 to 62.

What are your conclusions?

Knee arthrodesis and simultaneous leg lengthening can be done successfully with the Ilizarov method and frame. This enables the surgeon to optimize the leg lengths during knee arthrodesis. The use of external fixation is advantageous in the presence or history of infection. The Ilizarov frame provides stability that allows weight bearing during the treatment.