The Limb Lengthening and Reconstruction Society: ASAMI–North America

Sixteenth Annual Scientific Meeting
Abstract Form

Please complete entirely and return as an attachment via e–mail to **ksyzdek@assocconvspec.com** *or on diskette to Karen Syzdek, P.O. Box 91868, Austin, TX 78709–1868 by March 51, 2006. Questions? Contact Karen at (512) 301–7328 or* **ksyzdek@assocconvspec.com**.

Title: A Biomechanical Comparison of Micromotion After Ankle Fusion Using Two Fixation Techniques: IM Nail or Circular Fixation

Presenting Author: Austin T. Fragomen, MD Hospital for Special Surgery, 535 East 70th St, NY, NY 10021, 212-606-1550, Fax 212-606-1552, fragomena@hss.edu
(complete name, degree, institution, mailing address, telephone, facsimile, e-mail)

Co-authors: 1) Katheryn N Meyers, MS Hospital for Special Surgery
Include name, degree, institution 2) Svetlana Ilizarov, MD Hospital for Special Surgery
3) Timothy Wright, PhD Hospital for Special Surgery; S. Robert Rozbruch, MD Hospital for Special Surgery

Intramedullary nailing and Ilizarov external fixation are percutaneous techniques that offer rigid fixation for complex ankle arthrodesis. We compared the motion allowed at the fusion site by these two methods of fixation in a cadaver model. Our hypothesis was that the Ilizarov external frame would provide superior resistance to rotation and bending forces when compared with an IM nail.
8 pairs of human cadaver lower legs were prepard preserving the foot. DEXA scanning of the calcaneous was preformed. The soft tissues were stripped retaining foot ligaments to simulate more normal forces acting at the fusion site. Either a Biomet Arthrodesis Nail or Ilizarov Taylor Spatial Frame was used to stabilize the arthrodesis site. Specimens were potted in resin and tested in the MTS machine. Resistance to axial and torsional loads was tested to determine the stiffness of the two constructs. In order to record motion at the fusion site only, a three-camera Qualisys motion capture system was utilized. Optical data recorded three-dimensional displacements and rotations of the distal tibia relative to the talus for all tests. Relative motion was correlated with specimen bone density.
No significant difference was found between the axial displacements for the IM nail group (0.15+/-0.12mm) and the external fixation group (0.17+/-0.1mm). No significant difference (p=0.07) was found between the relative rotation for the IM nail group (0.91+/-0.71degrees) and the external fixation group (-0.31+/-0.33degrees). There was no correlation between the bone mineral density and the amount of displacement or rotation recorded.
Both the IM nail and the Ilizarov external fixator were found to provide superior stiffness to axial and torsional loads allowing minimal movement at the arthrodesis site. The motion capture system provided specific information about the motion occurring at the fusion site allowing for the retention of the foot which better simulates physiologic loading. For complex ankle arthrodesis either Biomet intramedullary fixation or Ilizarov fixation will provide excellent stability throughout a range of bone mineral densities. The decision of which implant to use should rely on other factors such as the presence of osteomyelitis or the need to violate the subtalar joint. Qualisys motion capture system is an excellent method to evaluate motion at any bony interface.

Select all that apply:

Category

- Limb Lengthening
- Trauma, Acute
- Nonunions
- Deformity Correction
- Research
- Deformity Analysis
- Other:

Deadline:

March 15, 2006

The Limb Lengthening and Reconstruction Society: ASAMI–North America

Abstract Application for LLRS Sixteenth Annual Scientific Meeting

July 21–23, 2006

Wyndham at Emerald Plaza – San Diego, CA

Instructions:

1. A complete mailing address is required for the first authors and all co–authors. Please provide an e–mail address is applicable.
2. The abstracts will be graded in "blind" fashion. The abstract text must not reveal the authors' institution of origin.
3. All co–authors must agree with the material being submitted.
4. If the paper is published before presentation, it cannot be accepted.
5. Completion of the disclosure statement below and the Faculty Disclosure Form sent upon acceptance is mandatory.
6. The individual listed as Presenting Author will receive all correspondence.
7. The abstract is to be typed in the space provided on the form.
8. The abstract is to be written in English.
9. Line drawing and figures may be submitted on a separate piece of paper. Do not include these in the text.
10. No photographs will be accepted.
11. Abstracts must be received by **March 15, 2006.**
12. LLRS reserves the right to withdraw a paper at any time.

Send the completed (both pages) and signed form to Karen Syzdek, LLRS, P.O. Box 91868, Austin, Texas 78709–1868 USA. *The first page must also be sent via e–mail to* **ksyzdek@assocconvspec.com** *or on diskette.*

This material has been or will be presented/published before July 21, 2006? yes no

If yes, where? Orthopaedic Research Society

Signature is required by the submitting author for the following statements.

Each author/co–author has reviewed this abstract submitted to the 2006 Annual LLRS Meeting and agrees with the material being presented.

Signature: _____ Date: 2/10/06

Disclosure Statement – below is a statement which may apply to you, your co-authors or your institution in connection with your abstract for the 2006 LLRS meeting. Please read the following statement, check with all co-authors, and answer "yes" or "no." All disclosures will be made available to the participants of the Sixteenth Annual Scientific Meeting.

One or more authors, co-authors or institution has received something of value in an amount of more than $500.00 from a commercial party related directly or indirectly to the subject of the abstract.

yes *no*

Signature: _____ **Date:** _____