Reviewer's report

Title: Mechanical properties during healing of Achilles tendon ruptures predict final outcome. A Roentgen stereophotogrammetric analysis in 10 patients

Version: 3 Date: 19 June 2007

Reviewer: Hans Zwipp

Reviewer's report:

This paper tries to answer the interesting question: how are the biomechanical properties changing during Achilles tendon healing. The authors implanted tantalum beads in conjunction with the surgical repair. The operation technique was one Vicryl suture (which thickness?) and fibrin glue. The postoperative treatment was 3 weeks cast in equinus und 3 weeks in neutral position. Tendon healing was studied with Roentgen stereophotogrammetric analysis in 10 patients.

The authors stated: There are presently no methods described for in vivo monitoring of the healing of human tendon ruptures. However, it is well known, that ultrasound is a good method to control the course of tendon healing without radiation exposure. If a defect or dehiscence is seen within the tendon, the clinical outcome can be predicted reliably and helps the indication to repeat surgery. The question arises, why the position of the markers was determined by CT scanning rather than with ultrasound, because this exposes the patients to larger doses of radiation.

As has been shown previously, tendon elongation develops after a biphasic course (appr. 1 cm after 7 weeks) [Mortensen et al., 1992]. In the technique used by the authors (Vicryl suture and fibrin glue) a correction of the foot position to neutral after 3 weeks presumably will determine most of the elongation by that time. When starting with the measurement of elongation after 6 weeks, it is impossible to measure the real tendon elongation.

The authors should discuss the existing literature dealing with implantation of metal markers. It is felt that this study has no clinical consequences. The results are nevertheless interesting (large variation of the strain/force and stiffness, changes between 18 weeks and 1 year). It is hard to draw any valid conclusions from the small patient sample with high individual variation.

What next?: Accept after minor essential revisions

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:

I declare that I have no competing interests