A seven year prospective, randomised, clinical and radiographic study after arthroscopic Bankart reconstruction using two different types of absorbable tacks

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Introduction: Short term radiographic assessments of the shoulder have shown that the radiographic visibility of the drill holes is significantly larger after using self-reinforced poly-L-lactic acid polymer (PLLA) implants than after using polyglucanate-B polymer (PGA) implants. The aim of the study was to compare the early C-reactive protein response and the seven-year clinical and radiographic results after arthroscopic Bankart reconstruction using two different types of absorbable implants in a prospective randomised series.

Materials and Methods: A randomised series of 40 patients who had recurrent, unidirectional, post-traumatic shoulder instability were included in the study. All patients underwent an arthroscopic Bankart reconstruction involving either PGA (n=20) or PLLA (n=20) tack implants. The patients underwent clinical and radiographic assessments pre-operatively and at seven years after the surgical procedure as well as assessment of the C-reactive protein response pre-operatively at day 1, day 7 and 4-6 weeks post-operatively.

Results: Pre-operatively, the study groups were comparable in terms of demographics, as well as clinical parameters. The median C-reactive protein in both groups was <10 units pre-operatively and at all post-operative measurements until the 4-6th postoperative week (n.s.), and no patient in either group developed early signs of shoulder synovitis. Thirty-four/40 (85%; 17 PGA, 17 PLLA) of the patients returned to follow-up after mean 81 (64-96) months. One patient in each group had re-dislocated during the follow-up period, furthermore one patient in the PLLA group and two patients in the PGA group had suffered subluxations during the same period. The total failure rate in terms of stability was 5/34 (15%) No statistically-significant differences were found at follow-up between the study groups in terms of strength in abduction, range of motion and Rowe or Constant scores. There was a significant increase in radiographically visible degenerative changes during the follow-up period in both study groups (p<0.01). No significant differences in degenerative changes were, however, registered between the study groups either preoperatively or at the seven-year follow-up. The radiographic visibility of the drill holes was significantly (p<0.0001) greater in the PLLA group than in the PGA group. All patients in the PGA group revealed invisible or hardly visibly drill holes. In the PLLA group eight patients had invisible or hardly visibly drill holes, while nine patients had clearly visible or cystic drill holes.

Discussion: There appears to be no, or only minor early inflammatory response towards both implants as measured with the C-reactive protein with no significant differences between the study groups. Seven years after arthroscopic Bankart reconstruction using either PGA co-polymer or PLLA polymer implants, the overall clinical results were comparable. Radiographic assessments revealed that the degenerative changes increased in both study groups during the follow-up period. Furthermore, the visibility of the drill holes on the seven-year radiographs was greater after using PLLA polymer implants than after using PGA co-polymer implants.

In the long term it appears that the drill holes after implanting PLLA polymer implants do not heal to the same extent as after implanting PGA co-polymer implants. This might have implications for the quality of the bone in the anterior glenoid if revision surgery is necessary. Due to the findings in the present study we at present do not recommend the use of PLLA implants for shoulder surgery. The findings in the present study emphasises the importance of developing new polymers with osteoconductive/osteoinductive capabilities.


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