



Figure 1. Cumulative risk of revision stratified by age (revision in dark; alive with no revision in light).

study. Future work should confirm and further explicate these findings in databases with more detailed information on clinical features and patient preferences.

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**THE USE AND OUTCOME OF HIGH TIBIAL OSTEOTOMY FOR KNEE OSTEOARTHRITIS IN SWEDEN 1998-2007**

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**Purpose:** Unlike for knee arthroplasties, there is no national register on high tibial osteotomies (HTO's) performed in Sweden. Information on the outcome of HTO as a treatment for knee osteoarthritis (OA) is insufficient. The aim of this study was to evaluate the use and outcome, expressed by rate of revision to knee arthroplasty, of HTO's performed in Sweden 1998-2007.

**Methods:** Using the in-patient and out-patient care registers of the Swedish National Board of Health and Welfare during 1998-2007, patients 30 years or older, with the surgical code NGK 59 (angle, rotation or correction osteotomy in the knee or tibia) in combination with the ICD-10 code M17 (knee osteoarthritis), were identified. The number of surgeries per clinic and County, the gender- and age distribution as well as changes over time were evaluated. Conversion of HTO to knee arthroplasty was identified using the Swedish Knee Arthroplasty Register (SKAR). 446/3,246 HTO's had been converted but for 42 of these side of the the HTO was unknown and thus, if the subsequent arthroplasty had been on the same knee. In these cases we assumed a worst case scenario of the arthroplasty being a conversion. A 10-year survival analysis was performed using revision to an arthroplasty as the end point.

**Results:** During 1998-2007 3246 HTO (2885 patients) were identified, or 325 per year on average. 8% were out-patient surgeries. During the period there was a 30% decrease in the number of HTO's performed per year. Men had surgery more often (69%) and their mean age at surgery was 52 years (SD 8) as compared to 50 years (SD 7) in women. In 1998, 58% of the patients were younger than 55 years, compared to 65% in 2007, with similar trends for men and women. HTO's were carried out in all Counties of Sweden. Five clinics (out of 75) performed 25% of all the HTO's. As a percentage of all knee reconstructions, HTO decreased from 6% in 1998 to barely 3% in 2007.

The cumulative revision rate (CRR) at 10 years, based on a worst case scenario, was 16% (95% CI 14-24). The risk of revision after adjusting for age was significantly higher in women than men (RR 1.45 (95% CI 1.14-1.83), p=0.002).

**Conclusions:** In absolute numbers HTO has decreased by 30% during 1998-2007 and constituted less than 3% of the primary knee reconstructions in 2007. HTO was almost exclusively used for patients younger than 65 years. The majority of the HTOs was performed in clinics performing only few surgeries per year. With HTO becoming uncommon, a need to

concentrate these surgeries to fewer and more experienced centers should be considered. The rate of conversion to knee arthroplasty was similar to what has been seen for unicompartmental knee arthroplasty.

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**JOINT DISTRACTION IN TREATMENT OF CANINE EXPERIMENTALLY INDUCED OSTEOARTHRITIS LEADS TO CARTILAGE REPAIR ACCOMPANIED BY SUSTAINED RELIEVE OF PAIN**

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**Purpose:** Osteoarthritis is a degenerative joint disorder characterized by progressive cartilage damage, peri-articular bone changes, and often secondary joint inflammation. These tissue structure changes coincide with pain, stiffness, and functional disabilities. Few options are available for treatment of end-stage knee osteoarthritis. Eventually, replacement of the affected joint using an endo-prosthesis is currently the accepted treatment option in end-stage osteoarthritis. Joint distraction might be an alternative for a total knee replacement, especially in younger patients. This treatment of osteoarthritis in humans results in long-term clinical benefit. The mechanism responsible for this benefit is unclear. Tissue structure modification was suggested to be involved. Therefore, joint distraction was applied in a canine experimental model of osteoarthritis to study the involvement of cartilage repair.

**Methods:** Osteoarthritis was induced in the right knee joint according to the Groove model (condylar surgical applied damage) in 16 dogs. Ten weeks post-surgery, the right knee joint was distracted for 3-5 mm by use of a hinged external fixator for 8 weeks in 9 dogs (distraction group). Seven dogs were left untreated (osteoarthritis group). Pain was studied by (un)loading of the joint using force plate analysis every 5-10 weeks. Twenty-five weeks after removal of the external fixators, cartilage integrity of the osteoarthritic, surgically untouched, tibial plateau was analysed.

**Results:** In the untreated osteoarthritic group, cartilage showed a decreased proteoglycan content (-18%, p<0.01), an increased proteoglycan release (+20%, p<0.03), and an increase in collagen damage (+2.5%; ns) when compared to the contralateral control joint. This was corroborated by an increased macroscopic and histological grade of cartilage damage (+1.8 and +3.3, respectively, both p<0.05). This loss of cartilage integrity was accompanied by decreased loading of the affected joint, especially reflected in a decreased brake and stance force (-0.35N and -0.70N, respectively, both p<0.05).

In the osteoarthritic joints treated for 8 weeks with distraction, 25 weeks later, the loss of PG content was -7%, in the distraction group, significantly less (p<0.02) decreased compared to the untreated osteoarthritis group, as was the proteoglycan release (+5%; p<0.05) which normalized. In addition less collagen damage was found (+0.3%). Again this was reflected in both the macroscopic and histological grade of cartilage damage (+1.3 and +2.8 respectively; p<0.05). This relative improvement of cartilage integrity was accompanied by a persistent increase of loading of the treated joint. Both the braking force and stance force normalized (p<0.05).

**Conclusions:** Joint distraction results in less cartilage damage and less pain (based on normalization of loading of the affected knee) in a canine model of experimentally induced osteoarthritis. The results of this animal in vivo study corroborate the observed cartilage repair and clinical benefit in human studies.

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**RECOVERY FOLLOWING TOTAL HIP AND KNEE REPLACEMENT: THE INTERPLAY OF PHYSICAL IMPAIRMENTS, ACTIVITY LIMITATIONS AND PARTICIPATION RESTRICTIONS**

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**Purpose:** Total joint replacement (TJR) is a frequently performed procedure