

GAIT ANALYSIS AFTER TOTAL HIP ARTHROPLASTY IN DYSPLASTIC HIP PATIENTS

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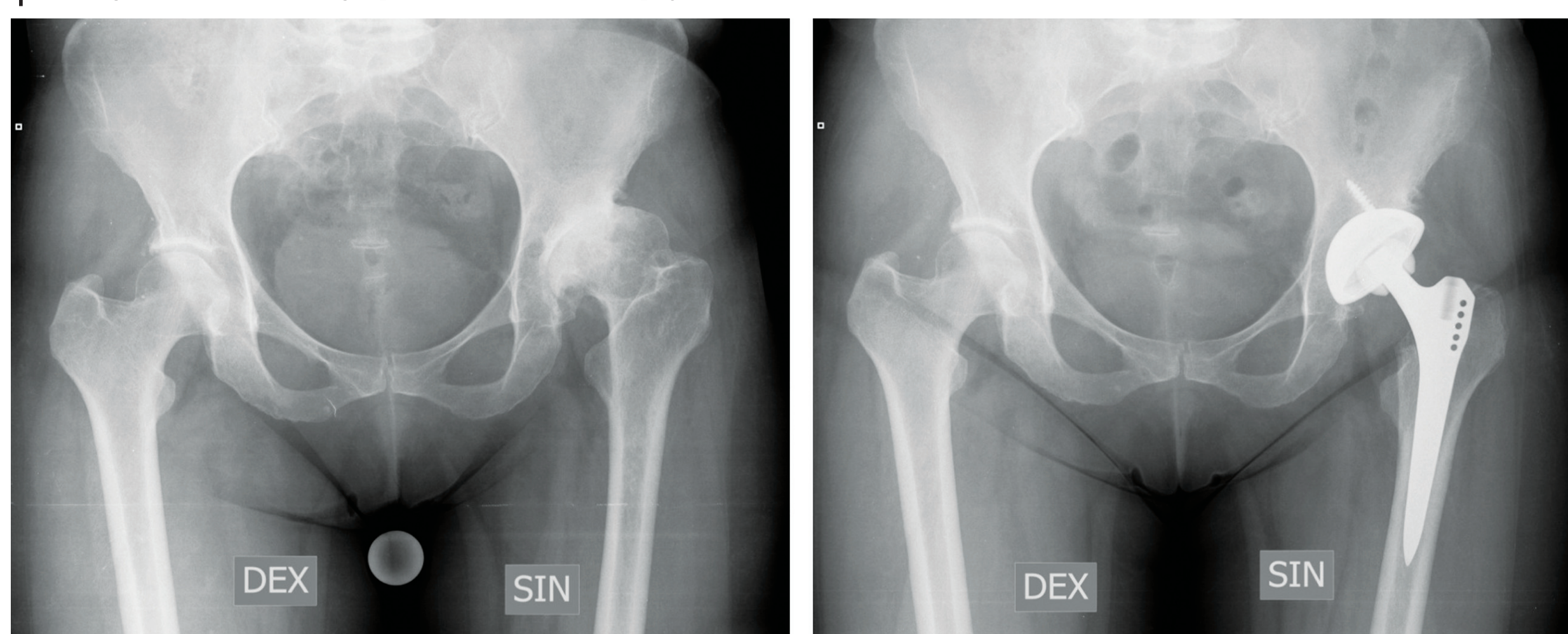
INTRODUCTION

Dysplastic hip osteoarthritis (OA) patients (pts) are relatively young and mostly women between 20 to 50 years of age [1]. The signs of OA are strongly associated with increasing age and the severity of dysplasia [2]. Dysplastic hip OA patients mainly complain of pain, bad range of movements, instability and waddling gait. The aim of total hip arthroplasty (THA) is to reduce these symptoms and to establish normal gait. For evaluation of functional outcome instrumental gait analysis was performed after THA. The results were compared with the data of the control group (15 persons without any diseases that could influence normal gait).

MATERIALS AND METHODS

In our study we examined 28 dysplastic hip OA pts who underwent 37 THAs (9 pts were operated bilaterally) in Riga State Hospital of Traumatology and Orthopaedics in 2009 and 2010. 22 pts were women, 6 - men. Average age was 48.7 years (32-65). In all the cases cementless endoprostheses were used. Plain X-rays of the pelvis were performed pre- and postoperatively for assessment of the grade of dysplasia (due to Crowe's classification)[3] and evaluation of the cup placement (in the primary or secondary socket). Instrumental gait analysis was performed at least one year after THA for all 28 pts and for the control group of 15 persons.

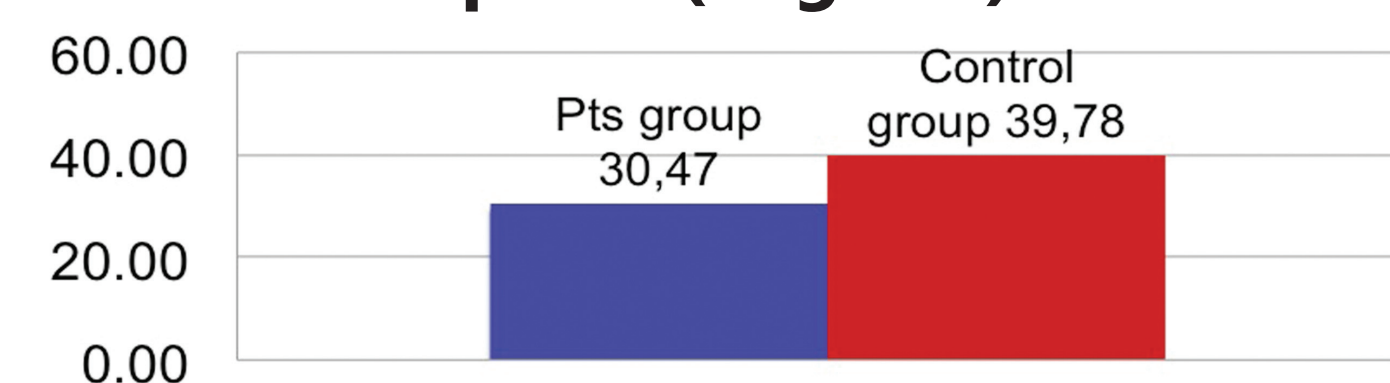
♀, 56 yo, Crowe I dysplasia of left hip joint after THA with cement less endoprosthesis



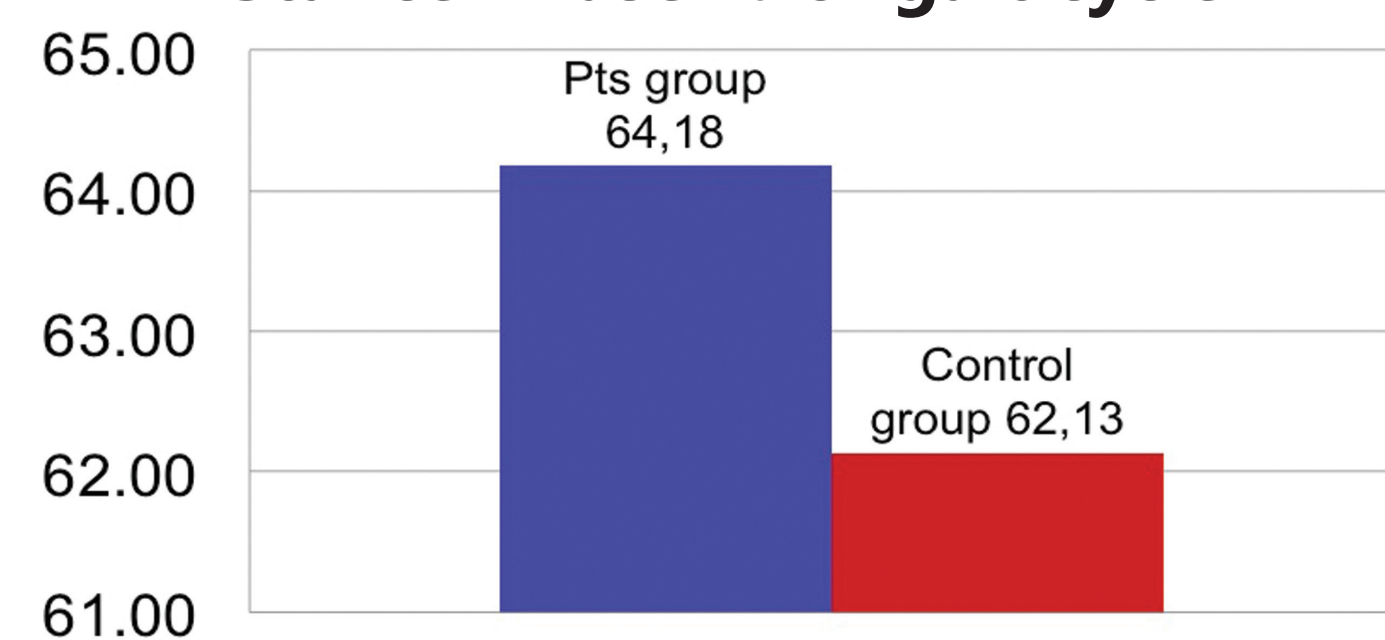
RESULTS

Due to Crowe's classification there were 17 cases with grade I, 10 – grade II, 9 – grade III, 1 – grade IV dysplasia. In 11 cases the acetabular components of endoprostheses were placed in the secondary socket, in 28 cases – in the primary (anatomical) socket. Instrumental gait analysis showed that there was a difference in distance and kinematic parameters in both groups (pts after THA and the control group). The stance phase duration in the pts group was 64.18%, in the control group 62.18%. The swing phase duration in the pts group was 36%, in the control group – 38%. In sagittal plane hip joint range of motions (ROM) in the pts group was 30.47°, in the control group 39.78°. Maximal flexion (average) in swing phase in the pts group was 34.51°, in the control group – 31.46°, but in stance phase max extension in the pts group (average) was – 4.04 (hip joint leaved in slight flexion), in the control group max extension was 8.32°. The ROM of pelvis (in sagittal plane) was higher in the pts group: 5.38 against 2.69° in the control group.

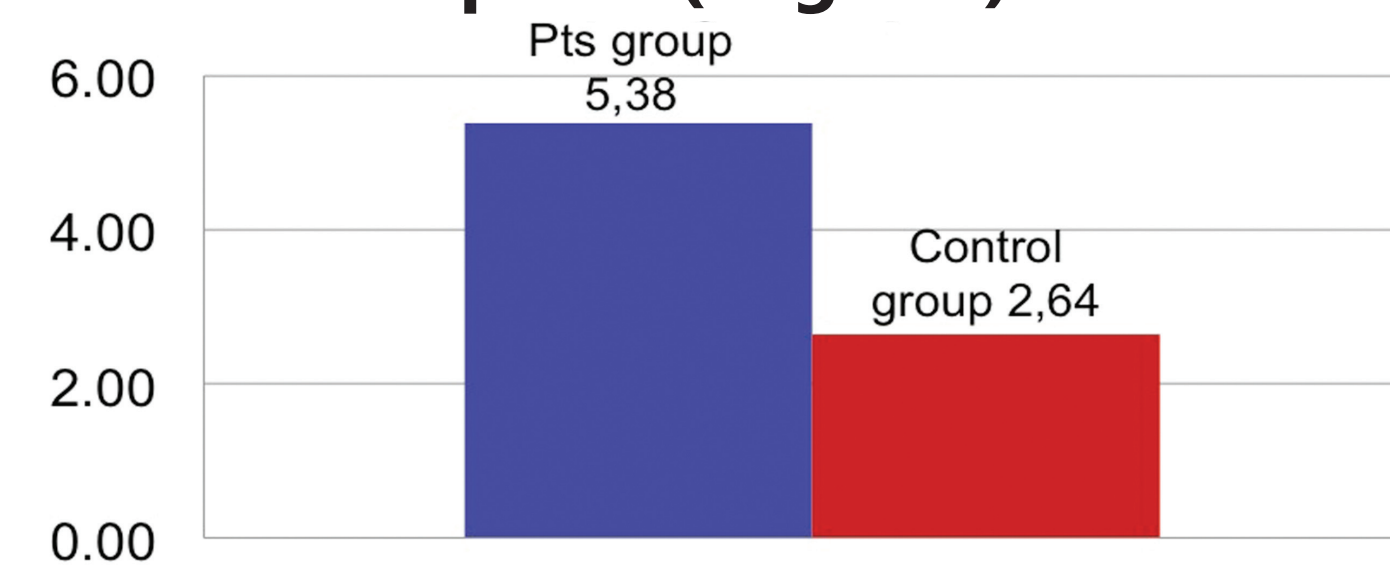
ROM of hip joint in sagittal plane (degrees)



Stance Phase % of gait cycle



ROM of plevs in sagittal plane (degrees)



DISCUSSION

Radical anatomical and biomechanical reconstruction of hip joint during THA may lead not only to local complications as overstretching of ischiadic nerve, contracture of hip joint, early loosening and wear of acetabular component of endoprosthesis, but even to the distress of the whole musculo-skeletal system. In severe dysplasia cases (Crowe III, IV) the choice to locate the acetabular cup in the secondary socket can even reduce the possible complication rate.

CONCLUSION

1.The instrumental gait analysis at least one year after THA showed significant improvement of gait parameters (close to normal gait) in the dysplastic hip OA patients. 2.There was no correlation between the functional outcome after THA and location of the acetabular component (in the primary or secondary socket).

REFERENCES.

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2. Rebecca H. Jessel, BA, David Zurakowski, PhD, Cristoph Zilkens, MD et al., Radiographic and patient factors associated with pre-radiographic osteoarthritis in hip dysplasia // JBJS, 2009; 91 : 1120 -1129.
3. Crowe J.F., Many V.J., Ranawat C.S. Total hip replacement in congenital dislocation of the hip // JBJS, 1979; 61A :15-23.