

Analysis of Nonunion of the Superior Pubic Ramus Osteotomy Site After Curved Periacetabular Osteotomy

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Abstract

Background/ aim: We have been performing periacetabular osteotomy (PAO) to treat acetabular dysplasia with good short- and mid-term outcomes. Minor complications may occur, such as nonunion of the superior pubic ramus and stress fracture of the inferior pubic ramus. In this study, we investigated the risk factors for nonunion of the superior pubic ramus.

Materials and Methods: We studied 70 patients (three male, 67 female; mean age, 36.0 years; range, 16–63 years) who were diagnosed with acetabular dysplasia (Tönnis grade 0–2) and underwent PAO from October 2011 to April 2013. We evaluated each patient's age, center-edge angle improvement, body mass index, bone mineral density, and distance of the superior pubic ramus osteotomy. The shortest distances in vacancy of the pubic ramus osteotomy site were measured on computed tomography images. Statistical analyses were conducted using the Mann–Whitney U test and multiple logistic regression analysis. Statistical significance was set at $P < 0.05$.

Results: Fifteen hips exhibited nonunion of the superior pubic ramus; all were asymptomatic. The average age at surgery was 42.6 years in the nonunion group and 34.5 years in the union group. There were three male and 52 female patients in the union group and 15 female patients in the nonunion group. The average body mass index was 24.5 kg/m² in the nonunion group and 22.0 kg/m² in the union group. The average bone mineral density was 95.4% in the nonunion group and 92.0% in the union group. The average distance of the pubic ramus osteotomy site was 4.38 mm in the nonunion group and 1.36 mm in the union group. The mean center-edge angle change was 27.2° in the nonunion group and 31.7° in the union group. The distance of the superior pubic ramus osteotomy site significantly affected the development of nonunion ($P = 0.003$). The mean Harris hip score improved from 73.6 points preoperatively to 93.6 points postoperatively.

Conclusion: We investigated the risk factors for nonunion of the superior pubic ramus. The distance of the superior pubic ramus osteotomy site significantly affected the development of nonunion.

Key words: Curved Periacetabular Osteotomy, Non-union, Superior Pubic Ramus