

THE MOVEMENTS AND MORPHOLOGICAL CHARACTERISTICS OF THE SACROILIAC JOINT

Seon Jin Shin (1), Anna Jeon (1), Tae Soo Bae (2), Dai-Soon Kwak (1)

1. The Catholic University of Korea, South Korea, 2. Jungwon University, South Korea

Introduction

Dysfunctional sacroiliac joint (SIJ) was considered as a source of the lower back pain [1]. Several researchers investigated anatomy and biomechanics of the SIJ to understand the relationship between the lower back pain and the SIJ. Many studies concluded the SIJ has little movement. However, some of the studies using spinopelvic parameters mentioned high pelvic incidence (PI) change [2]. Moreover, with the development of imaging techniques such as EOS system and vertical CT / MR, interest in sacroiliac joint movement and sagittal balance is increasing. Therefore, in this study, the movement of the sacroiliac joint were investigated by constructing an environment that could be measured and controlled more precisely than in past experiments. And we compared the morphological parameters of the sacroiliac joint between the small and the large movement groups.

Methods

We used 38 fresh cadavers (male 18, female 20). The mean age was 84.25 (81~92) years, and the mean height was 155.47 (142~161) cm. The changes in angle between the sacrum and hip bone were measured with sit and prone positions. Six optical markers were fixed on the surface of the bone directly, and five motion tracking cameras were used. After measuring the SIJ movement angle by weight bearing, the group with small movement and large movement were classified, and the difference in joint surface shape between the groups was analyzed (Fig. 1).

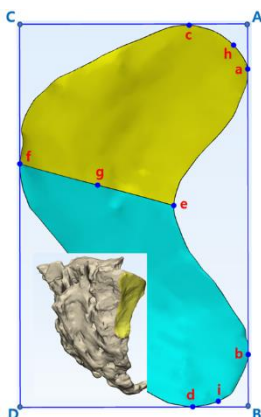


Figure 1: Measurement parameters for morphological characteristics of the SIJ.

Results and discussions

Based on the SIJ movement angle of 2 degrees, they were classified into two groups (Fig. 2). In the group with small movement (group A), the ratio of males was high at 14 males and 5 females, and in the group with

large movement, the ratio of females was remarkably high at 4 males and 15 females. column. There was no statistical difference in the articular surface shape of the SIJ between the two groups.

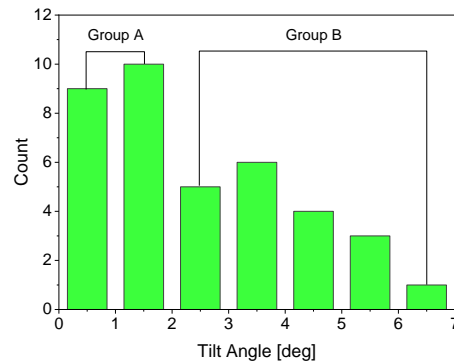


Figure 2: Histogram of the movement of SIJ. Group A means small movement and group B means large movements

	Group A		Group B		p
	mean	SD	mean	SD	
AC [mm]	29.97	2.82	29.42	4.42	0.638
AB [mm]	57.80	5.65	56.88	4.08	0.473
ef [mm]	23.17	3.36	22.86	3.56	0.789
gh [mm]	26.76	3.29	28.06	4.00	0.238
gi [mm]	39.44	4.27	36.83	4.65	0.095
gh [mm]	27.14	3.37	28.63	3.95	0.177
gi [mm]	40.91	4.36	38.09	5.15	0.087
aeb [deg]	133.79	8.75	134.55	11.23	0.815
upper [mm ²]	484.50	98.31	513.18	114.60	0.332
lower [mm ²]	654.68	114.67	597.51	128.50	0.069

Table 1: Measurements results for morphological parameters of the SIJ

References

- Lindsey et al, Med Devices (Auckl), 7:131-137, 2014.
- Park et al, Arch Orthop Trauma Surg, 137(9):1223-1232, 2017.

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