Title: Anatomical study of Lisfranc Ligament Complex

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【PURPOSE】The purpose of this study was to determine the anatomical characteristic of Lisfranc Ligament Complex.

【SUBJECT and METHODS】We studied the morphological characteristics of joint and ligament (Lisfranc Ligament Complex) that consisted of Lisfranc ligament (LL), second metatarsal (M2), first cuneiform (C1), and second cuneiform (C2) from 39 preserved cadavers. The materials were obtained from 34 feet from male and 44 feet from female (mean age: 84.5 years). In addition to Lisfranc ligament complex, we took out the first metatarsal (M1), third metatarsal (M3), and third cuneiform (C3). The distribution and morphology of the dorsal ligament (DL) between C1 and M2, planter ligament (PL), and C1-C2 interosseous ligaments were observed. We measured the area of LL attached to C1 and M2, and searched for the center of balance.

【RESULTS】We found that LL split up into one to four bundles (average 2.0 bundles). The average area of C1 was 81±21mm² (ave.). The average area of M2 was 88±19mm², that was attached to the planter side of M2. There was articular cartilage between M2 and C1 which was shown in 95% of all subjects. DL had a belt like shape and the thickness of the center of the belt like portion was 1.1±0.1mm (ave.). PL varied in shapes Y-shaped, V-shaped, and straight-shaped, and unclassified. The shape of ligament and area of its attachment had no relation to articular cartilage.

【DISCUSSION】The shape of attachments and areas of LL was widely diversified, but the center of balance was concentrated in both C1 and M2. A biomechanical approach is necessary for further clarification of ligament function.