

Research article - History of anatomy and embryology

Tailor's bunion in "Agony in the garden" canvas by Perugino (1446-1523)

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Foot deformities have been often depicted in Renaissance paintings. Despite the impressive knowledge of anatomy, which led those painters to draw life-like human figures, the deformation of toe-fingers and post-axial polydactyly represents a recurrent theme (Coralli et al., 2015; Lazzeri et al., 2015).

Speculations have been raised over the representation of foot deformities. These have been interpreted, in turn, as the stylistic trend of a given artist and, in a few cases, as the intentional and realistic representation of a foot pathological condition. Similarly, it has been speculated that foot deformities associated to specific person-ages, such as the Saints or the Virgin, had an underlying symbolism and were associated to martyrdom, poverty and humility (Lazzeri et al., 2015).

Here we describe a bone deformation in the painting "Agony in the Garden" (1483-1493) ("Orazione nell'orto", Uffizi Gallery, Florence) by Pietro Perugino (1446-1523), one of the most famous masters of the Italian Renaissance. The scene represents Jesus who is receiving a divine chalice by an Angel in the Gethsemane Garden before his arrest and crucifixion (Figure 1A). Behind the Christ, two groups of soldiers led by Judas Iscariot (first figure on the left- arrowed) are depicted. If carefully observed, a lateral prominence of Judas' right foot consistent with a bunionette can be discerned (Figure 1B).

"Tailor's bunion" or bunionette is a cluster of deformity characterized by a lateral prominence of the fifth metatarsal head (Davies, 1949; Di Domenico et al., 2013). The term "tailor's bunion" is due to the cross-legged position of the tailor resulting in pressure on the lateral side of the foot. The accurate incidence is not known, but it is far less than hallux valgus (Bertrand et al., 2011).

It can have three types of deformity: i. enlargement of fifth metatarsal's head without marked angulation, ii. abnormal bowing of the metatarsal and the secondary angulation of the metatarsophalangeal joint, iii. increased angle between the fourth and fifth metatarsals with angulation at the metatarsophalangeal joint being secondary to medial pressure on the phalanx (Figure 1C).

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Figure 1 – A. Pietro Perugino (1446-1523). "Agony in the Garden", 1446-1523; **B.** Close-up of Judas' right foot showing the deformation; **C.** Type 3 tailor's bunion: increased angle between the fourth and the fifth metatarsals with angulation at the metatarsophalangeal joint. Panels A and B from the original painting in the Uffizi Gallery, Florence, Italy, with permission of the Italian Ministry of Cultural Goods and Activities and of Tourism. It is forbidden to reproduce or duplicate these images by any means.

Deformation can be caused by extrinsic (chronic traumatic stimulations) or intrinsic factors (structural abnormalities as primary hypertrophy of the metatarsal head, abnormal insertion of inter-metatarsal ligament, congenital lateral bowing of the metatarsal shaft or brachymetatarsia) (Di Domenico et al., 2013). Furthermore, underlying

pathologies such as osteoarthritis, rheumatoid arthritis, and gout can all play a causative role in tailor's bunion deformity (Ajis et al., 2005).

The prominent metatarsophalangeal angulation of the joint suggests that the malformation painted by Perugino could correspond to a type 3 bunionette, a lesion that has a 4-5 inter-metatarsal angle in excess of the normal 6°-8°. Furthermore, an initial deformation of the big toe (hallux valgus) accompanied by a space restriction between the second and third toe fingers and a sprain of the ankle can be appreciated.

Clinically, it can be hypothesized that either the model had suffered of a structural abnormality of the foot or that a biomechanical cause, such as the habitual use of narrow and pointed shoes widespread in the Renaissance (Mays, 2005), may have played a role in the deformation. As far as symbolism is concerned, it can be speculated that Perugino highlights the perfect human figure of the Christ whose atonement saves the humanity. But, in the meantime, at the background, Judas the betrayer is presented. Judas symbolises the mankind, the sinners, and is surrounded by men that are indistinguishable from him. Nevertheless, the foot deformation he bears allows the viewer to recognize immediately the man who will betray the Christ. Here we have reported on a forefoot condition that adds to the pathologies depicted in the Italian Renaissance art and speculated on a possible symbolic significance attributed to the deformation of Judas' fifth toe.

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