

Foot deformities in Renaissance paintings. A mystery of symbolism, artistic licence, illusion and true representation in five renowned Renaissance painters

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ABSTRACT Although Renaissance artists were skilled in representing normal anatomy, a close look at some paintings reveals anatomical variations in the depiction of the feet of human figures. A systematic review has identified 25 paintings by five artists in which the presumptive medico-artistic diagnosis of congenital or acquired foot deformity seems to be varyingly present. The connection between these five painters and what factors have influenced artists' style in the depiction of such deformities is discussed. The possible iconography and medical–historical meaning of such variations, as well as the possibility of artistic licence and real representation that drove the painters to depict these deformities, is explored and debated.

KEYWORDS artistic licence, extra digit, foot deformity, polydactyly, prominence, Renaissance painting

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INTRODUCTION

The aim of this study was to investigate the depiction of anatomical variations in the feet of human figures in the paintings of five Renaissance artists. A closer look at the details of these paintings seemed to suggest the varying presence of a presumptive diagnosis of congenital or acquired foot deformity. In addition to the descriptions of a few cases previously described and already published,^{1–7} we recognised further cases and tried to understand the connection between these five artists and the factors that influenced the artists' style when depicting the deformities. Throughout this paper, we have summarised the paintings already cited and those newly discovered, and have explored their accuracy and, when present, the underlying presumable iconographical significance.

THE PAINTERS

Taking a close look at the paintings of Raffaello Sanzio (aka Raphael, 1483–1520), Pietro di Cristoforo Vannucci (aka Pietro Perugino, 1446–1524), Timoteo Viti (1469–1523), Giulio Pippi de' Jannuzzi o Giannuzzi (aka Giulio Romano, 1499–1546) and Francesco di Giorgio Martini (1439–1501), it is impossible not to come across the anatomical details of figures depicted by these painters.

The style of Raphael is immediately recognisable because of clear compositional organisation and the avoidance of excessive detail, which provided a useful means for expressing the new spirit of the High Renaissance. However, some canvases attributed to these painters and their workshops show a variation in their depiction of the feet. This is probably not due to the carelessness of the painters, well known for their attention to detail. In many works, the accuracy and details with which the painters, particularly Raphael, depicted the feet of their paintings' figures was so remarkable that the feet were of idealised grace in some cases, but less so in other instances. Should each variation receive a potential medico-artistic diagnosis of congenital or acquired foot disease? Were the variations realistic details of real persons or was there any religious meaning or symbolism behind those details? Were Raphael and the other four painters so skilled as to catch and depict the natural variation in foot shape and the position of the foot particularly when considering the greater prominence of the outside of the foot in barefoot and non-barefoot figures? Did they use the same (affected) person or family as models for their canvas? Had Raphael been inspired by previous artists such as Pietro Perugino, Timoteo Viti and Francesco di Giorgio Martini? Did he influence some of his pupils, in particular Giulio Romano? This paper aims to answer these questions.



FIGURE 1 A) Left barefoot of St Joseph. Detail of *The Marriage of the Virgin*, Raphael (1504); B) Left feet of St John the Baptist and Mary the Virgin. Detail of *La belle Jardinière*, Raphael (1507); C) Right foot of Christ. Detail of the *Madonna and Child*, Raphael (1498); D) Left foot of the infant Jesus. Detail of the *Madonna of the Fish*, Raphael (1513–4); E) Left foot of Christ. Detail of *The Holy Family Meeting the Infant St John the Baptist* by Raphael (1518–20); F(i) Left foot of the Virgin not in a weight bearing position, F(ii) the feet of Jesus nailed to a block on the crucifix and F(iii) left foot of St John the Evangelist, standing to the left of the cross. Details of the *Mond Crucifixion*, Raphael (1503–4); G) Left foot of St John the Evangelist. Detail of the *Mond Crucifixion*, Raphael (1503–4); The foot of St John has been examined using an infrared photograph. There was no trace of post-depiction adjustments to the original proportions of the foot. Image credits in Appendix.

THE PAINTINGS

On first view, in *The Marriage of the Virgin* (Raphael, 1504), the left foot of St Joseph appears to include six toes. Mimouni et al. suggested a diagnosis of postaxial polydactyly with an extra digit articulating with the fifth toe (Fig. 1A).¹ Weisz et al. attributed the prominent swelling on the side of the little toe to a typical chronic ‘gouty pouch’, or localised swelling at the metatarsophalangeal joint.² In *La belle Jardinière* (Raphael, 1507) (Fig. 1B), St John the Baptist is gazing at the Christ child and seems to exhibit a sixth toe on his left foot, and Mary the Virgin shows a prominence in the lateral margin of the same foot.

In *Madonna and Child*, one of the first frescoes by the 15-year-old Raphael, finished in 1498, Cantini observed that the right foot of the child seems to have six toes (Fig. 1C).³ The original fresco is not clear enough to

make any further comment on this.^{8,9} The attribution of this fresco, which was discovered in the room where it is believed Raphael was born, was contested, with some authors believing it to be the work of Raphael’s father, Giovanni Santi, representing Raphael and his wife. The similarity of that Madonna’s face with the face of the maid in the *Nativity of the Virgin* painted in the dais of Fano altarpiece, depicted by Pietro Perugino and his workshop (including Raphael), suggests that both works were Raphael’s.

Although Fernandez-Menendez suggested a diagnosis of hexadactyly in the infant Jesus sitting on the knee of the enthroned Mary in *Madonna of the Fish* (Raphael, 1513–4) (Fig. 1D), there is little evidence to confirm this,⁴ while the left foot of Christ in the *The Holy Family Meeting the Infant St John the Baptist* (*The Madonna del Passeggio*; Raphael, 1518–20) (Fig. 1E) is suspected to show an abnormal prominence of the lateral margin that the



FIGURE 2 A) Jesus' left foot (i) and left foot of the angel (ii). Details of the *Oddi Altarpiece*, Raphael (1502–1504); B(i) Right foot of Jesus supported by the hand of the mother. Detail of the *Solly Madonna*, Raphael (1500–4); B(ii) Right foot of Jesus supported by the hand of the Madonna and Child with Saints Jerome and Francis, Raphael (1500–4); B(iii) Left foot of Jesus supported by the hand of the mother. Detail of the *Orleans Madonna*, Raphael (1506); B(iv) Left foot of Jesus supported by a pillow. Detail of the *Madonna della Tenda* by Raphael (1514); C) The feet of Christ. Detail of the *Transfiguration of Christ*, Raphael 1520; D(i) St Joseph's right foot and D(ii) left foot of a woman near the Virgin (right). The *Marriage of the Virgin*, Pietro Perugino (1500–4). Image credits in Appendix.

same author considers polydactyly.⁴ Regardless, some art critics have attributed this last work to the workshop of Raphael, in particular to one of his pupils (Gian Francesco Penni or Giulio Romano), who was inspired by Raphael's design.

Mond Crucifixion (1503–4, aka *Crocifissione Gavari* or *Gavari Altarpiece*) (Figs. 1F and 1G) is an early work by Raphael that was strongly influenced by his master Pietro Perugino. This canvas is interesting because it includes a visual evaluation of the feet depicted in different poses.⁵ The three figures show a suspected prominence on the lateral margin of the feet that should be analysed, whether the foot has been depicted barefoot or not. In *Mond Crucifixion*, the feet of Jesus are nailed to a block on the crucifix and the left foot of St John the Evangelist, standing to the left of the cross, is supported by the ground. Interestingly, although the left

foot of the Virgin is not in a weight bearing position, it has been depicted in the same way.⁵

The upper section of the *Oddi Altarpiece*, painted by Raphael between 1502 and 1504, shows the crowning of the Virgin by Christ while angels are playing music (Fig. 2A). Jesus' left foot shows an abnormal prominence that may be interpreted as a sixth toe, whereas the abnormal appearance of the outer margin of the left foot of the angel playing the violin to his left seems more likely linked to its plantar flexion.

In *Solly Madonna* (Raphael, 1500–4) (Fig. 2B(i)) and in *Madonna and Child with Saints Jerome and Francis* (1500–4) (Fig. 2B(ii)), Raphael depicted the right foot of Jesus supported by the hand of the mother and by a pillow, respectively, revealing a suspected protrusion of the outside of the foot. The same theme is represented by

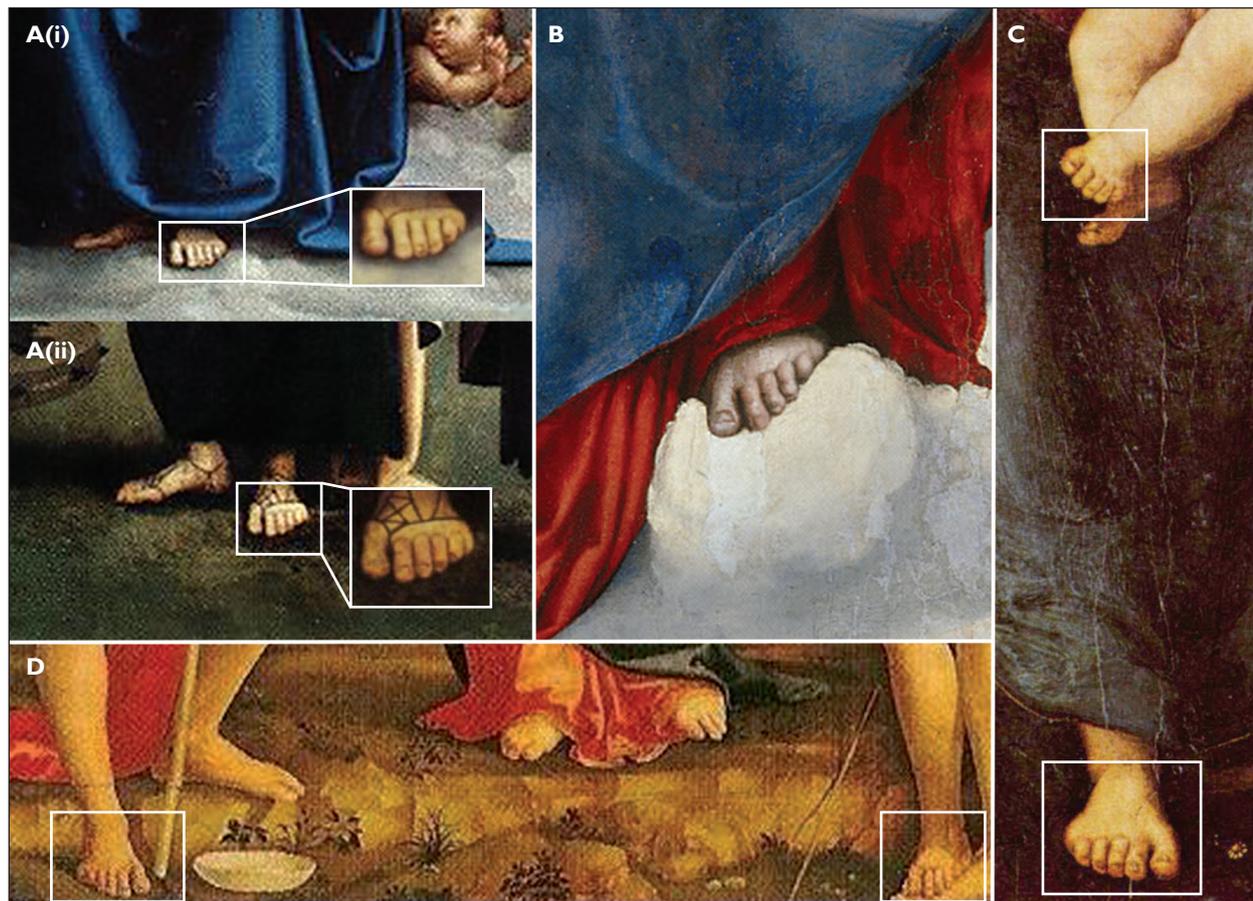


FIGURE 3 A(i) Left feet of the Virgin in the upper part of the painting and (ii) Apollonia. Detail of the Madonna in Glory with Saints, Pietro Perugino (1500–1); B) Left foot of the Virgin. Detail of the Madonna of Foligno, Raphael (1511); C) Left foot of Christ bearing no weight (above) and the left foot of the Virgin (below). Detail of the Virgin with Child, Pietro Perugino (1490); D) Detail of The Virgin with Saints Sebastian and John the Baptist, Timoteo Viti (1515). Image credits in Appendix.

Raphael in the *Orleans Madonna* (1506) (Fig. 2B(iii)) and *Madonna della Tenda* (1514) (Fig. 2B(iv)).

The peculiar mode of depiction of the feet with an abnormal prominence or swelling of the outer margin of the foot of Christ and of Elijah the prophet can also be observed in Raphael’s final painting, *Transfiguration of Christ* (1520) (Fig. 2C). Curiously, this painting was incomplete at the time of Raphael’s death and his pupil, Giulio Romano, completed it; it would be of interest to know if the section of the painting including the foot is by Raphael or Giulio Romano.

INFLUENCES ON AND BY RAPHAEL

The artistic growth of Raphael started at a very young age as an apprentice in the workshop of Pietro Perugino, one of the Renaissance masters. Wölfflin has highlighted the teachings and the early influences that Raphael received from Perugino: ‘probably no other pupil of genius has ever absorbed so much of his master’s teaching as Raphael did.’¹⁰

Three of Perugino’s paintings are of interest in the present study. *The Marriage of the Virgin* (1500–1504) (Fig.

2D) confirms the influence he had on Raphael. St Joseph shows an abnormal prominence (sixth toe?) on his right foot as does the woman near the Virgin (left foot).⁶ The same theme was later painted by Raphael in the more famous *The Marriage of the Virgin* (Fig. 1A). In *Madonna in Glory with Saints* (Pietro Perugino, 1500–1501) (Fig. 3A), both the Virgin in the upper part of the painting and Apollonia (third figure from left) seem to exhibit a supernumerary digit on their left feet. The scheme of the painting, which is divided into two levels, is very similar to another Madonna depicted by Raphael (*Madonna of Foligno*, 1511). In this last case, the prominence seen near the fifth toe of the left foot is more likely attributable to the plantar flexion of the Virgin’s foot (Fig. 3B). In Perugino’s *Virgin with Child* (1490) (Fig. 3C), the left foot of Christ shows a suggestive outer protrusion, though it bears no weight, whereas the left foot of the Virgin is depicted with a prominence near the fifth toe.

Timoteo Viti replaced Raphael’s deceased father, Giovanni de’ Santi (1494), as painter of the court of Urbino.⁹ Raphael was only 11 years old but went on to take care of his father’s workshop with the help of his family. Reading Raphael’s biography it is clear that the painter learned all of the basic teachings in his father’s workshop

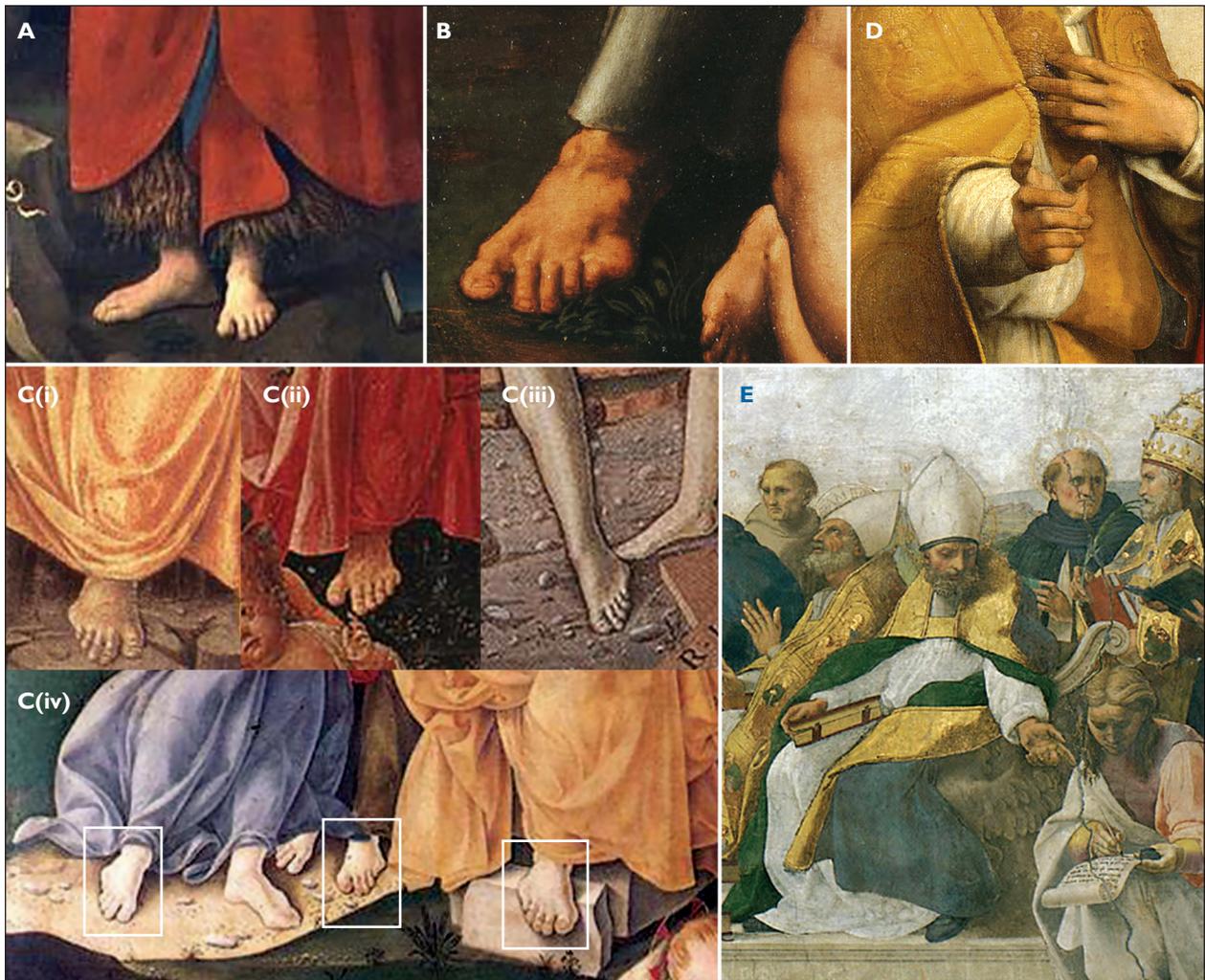


FIGURE 4 A) Left foot of Mary Magdalene. Detail of *Saint Mary Magdalene*, Timoteo Viti (1508); B) Left foot of St Joseph. Detail of *The Holy Family* by Giulio Romano (1520–3); C(i) Right foot of St Joseph. Detail of *the Nativity*, Francesco di Giorgio Martini (1470); C(ii) Left foot of St Joseph. Detail of *the Nativity*, Francesco di Giorgio Martini (1475); C(iii) Left foot of Christ. Detail of *The Disrobing of Christ*; Francesco di Giorgio Martini (1501); C(iv) Right foot of St Joseph supported by a rock, and left and right feet of the leftmost angels. Detail of *Adoration of the child*, Francesco di Giorgio Martini (1485–90); D) Right hand of Pope Sixtus IV. Detail of *The Sistine Madonna*; Raphael (1512); E) Left hand of Pope Julius II. Detail of *The Disputation on the Holy Sacrament*, Raphael (1509–10). Image credits in Appendix.

and completed his education under the tutelage of both Timoteo Viti and Pietro Perugino, who greatly contributed to Raphael's training and influenced his formation, especially his first artistic experiences.^{8,9} In *The Virgin with Saints Sebastian and John the Baptist* (1515) (Fig. 3D), Viti depicted the right foot of St John and the left foot of St Sebastian with visual evidence of presumptive polydactyly, whereas in *Saint Mary Magdalene* (1508) (Fig. 4A), the figure shows a suspected prominence on the lateral margin of her left foot, which is depicted in a weight bearing position. These are late productions by Viti, so we can dispute whether he was influenced in painting the 'artistic anatomic anomaly' solely by Perugino, who was 24 years older, or by Raphael as well, who was 14 years younger.

An analysis of *Holy Family* (1520–3) (Fig. 4B), painted by Raphael's pupil Giulio Romano, reveals a prominence on

the side of the little toe of St Joseph. Weisz et al. have concluded that this was the typical expression of chronic 'gouty pouch', or a localised swelling at the metatarsophalangeal joint of the little toe.² An abnormal prominence is also visible on the feet of St Joseph in some canvases painted by Francesco di Giorgio Martini (Fig. 4C), who was an artist appreciated by Raphael's father.^{8,9} In one of the *Nativity* (Fig. 4C(ii)), St Joseph even seems to exhibit an extra toe, and in the *Disrobing of Christ* (Fig. 4C(iii)), Jesus presents again a suspected prominence on the outer margin of the left foot. In the painting from the 1490s (Fig. 4C(iv)), Martini depicted three figures as having a suspected prominence on the lateral margin of the foot, with each of the feet in different poses. The right foot of St Joseph is supported by a rock, and the left and right feet of the leftmost angels have been depicted in the same way, although the first is supported by the ground and the latter is not in a weight bearing position.

The fine art of diagnosis in paintings

In a clinical setting, the diagnosis of congenital and acquired diseases of the foot is usually confirmed through a combination of patient history, visual evaluation and assessment of phenotypic features, imaging and specific blood or genetic tests. A medical diagnosis in the artistic field, such as those discussed in the present study, can be provided only via a thorough direct visual evaluation and assessment of the canvas or the fresco; this type of identification is considered a 'presumptive diagnosis' of a congenital or acquired foot deformity. As a matter of fact, such diagnosis remains presumptive, being merely an interpretation of the artist's intentions and depicted figure's background unless written documents reveal the real intention of the painter.

According to Philippot,¹³ the tentative interpretation of depicted diseases in terms of medical art diagnosis should follow three stages. First, 'the style': the painting should be interpreted through the cultural background of that artist's period. Second, 'the work' of the artist: the relevancy of the artist's style in capturing the reality and his/her reputation inside the artistic movement. Third, the 'specific interpretation' of a definite painting and how solid is the basis provided for a true scientific diagnosis.

In the present study we tried to consider all three stages. All the subjects were painted by one of five renowned artists ('the work') of the Renaissance, a movement that is known for making significant advances in the realistic and precise representation of people, space and objects ('the style'). The debate about the scientific basis of the diagnosis of foot deformity is analysed in the following discussion section ('specific interpretation').

DISCUSSION

During the Renaissance, the increasing interest in anatomy and the inter-relationships between various parts of the human body allowed artists to produce lifelike portrayals. Because of the close collaboration between medical science and art, observers expected artworks to be a real representation of what artists were observing, combining medical and artistic knowledge.¹³ The depiction of certain types of deformities and distortions are almost always present because this illustrated the artists' hallmark styles and their skill in reproducing human figures; although in general the norm was to portray the body as realistically as possible.¹³

According to Baxandall,¹⁴ the perception of the human body made by those involved in the medical field is often more critical than most when observing paintings that represent the human body itself. For this reason, health professionals may notice anatomic peculiarities in portraits 'bringing to the picture a mass of information and assumptions drawn from general experience'.¹⁴ The

depiction of possible deformities and the reason why signs of disease appear in some paintings are of particular interest to medical observers. Interpretation is always controversial because the real intention of the artist to reproduce the deformity should be distinguished from the stylistic feature of the artistic movement of that era. The diagnosis may help in the identification of genetic familiar or acquired diseases; it may also assist in the recognition of individuals when a diagnosis can be correlated with known data concerning the subject's medical conditions.

Medical diagnosis has been helpful in the identification of the young male depicted in Pontormo's *Halberdier*. A comparison of the pathological anomalies of the finger joints in the left hand of the *Halberdier* with those depicted in three acknowledged portraits of Cosimo I de' Medici showed a close correspondence between the *Halberdier*'s hand deformity and that of Cosimo I.¹¹ These findings supported the conclusion that Pontormo's *Halberdier* was Cosimo I as a young man.¹¹ Livingstone and Conway examined Rembrandt's self-portraits and shed light on the diseases affecting the Flemish Master. Rembrandt's eyes were exotropic in 35 out of 36 self-portraits, with his left eye looking straight ahead while the other eye deviated outwards; the authors suggest that Rembrandt actually had a unilateral strabismus.¹⁵

The easiest explanation for the depiction of foot deformity in some Renaissance paintings is that all of the anatomical variations described throughout this paper deal with some artifacts or mistakes by the painters. However this is unlikely, as all the painters mentioned in this study have styles admired for clarity of form, clear compositional organisation and the visual effect of their works. These qualities give the artists a strong reputation for attention to detail and leaving little to chance.^{8,9}

Extra digit descriptions are already present and known in the ancient literature. Verses 20–21 in the second Book of Samuel, in the version of the Bible authorised by King James I, state:

And there was yet a battle in Gath, where was a man of great stature, that had on every hand six fingers, and on every foot six toes, four and twenty in number; and he also was born to the giant. And when he defied Israel, Jonathan the son of Shimea the brother of David slew him.

The 'man of great stature' was the son of a 'giant' called Rapha. Was Raphael influenced by the Holy Scriptures? Although this is a possible iconographical meaning that should be taken into consideration, it seems unlikely that the devilish negative connotation¹⁶ of having six fingers or toes could be somehow depicted on Christ or other figures. It is also unlikely that Perugino, Viti, Martini and Romano had accepted those meanings when depicting similar anomalies in their canvases. Experts of symbolism

may argue that the presence of an extra digit was used to indicate a 'sixth sense' in that person who was engendered by 'initiation' with a higher power.^{6,7} Art historians have long debated the meaning of the six fingers. In two paintings, Raphael seems to play and create an illusion with perspective and two Popes seem to exhibit six fingers. In *Sistine Madonna* (1512) (Fig. 4D), the right hand of Pope Sixtus IV is pointing at the beholder and seems to have an extra digit (although closer examination reveals no polydactyly). Heindel (1865–1919) promoted the theory that the painter made a play on the number 'six' in his name and the Pope having a 'sixth' sense.¹⁶ Raphael also gave Pope Julius II an extra finger in *The Disputation on the Holy Sacrament* (1509–10) (Fig. 4E), even if the fresco is not clear enough to make any further comment. Regarding the depiction of an extra toe on St Joseph, Heindel has argued that Raphael wants to show us that Joseph possessed a sixth sense and that he might not be a blind leader, having the 'seeing eye' required to point out the Way, the Truth, and the Life;¹⁶ however, this is contradicted by the fact that there were a high number of subjects to which a presumptive polydactyly has been added.

For those who are attracted by the idea of intentional representation of a pathological condition by the painters, variations in depiction of feet in the canvas shown in Figures 1B, 1C, 1E, 2A, 2B, 3A, 3B and 4C may resemble an extra digit articulating with the fifth toe. The presumptive medico-artistic diagnosis in these cases suggests postaxial polydactyly, a congenital anomaly described as the condition of having supernumerary digits beyond the fifth finger or toe.^{17,18} There are genetic markers that predispose to this condition, and its varying degrees of expression (phenotype) range from some extra tissue on the side of the foot, to tissues comprising some bone, and more rarely, to an entire extra functioning digit.^{17,18}

Postaxial polydactyly in particular has been confirmed to be a genetic trait manifested across members of a family, often affecting several generations. Conversely, the abnormal prominence of the outer margin of the foot seen in the remaining paintings (Figs. 1A, 1D, 1F, 1G, 2A, 2C, 2D, 3A–D, 4A–C) may be identifiable as an acquired foot deformity. A presumptive diagnosis of rheumatic and arthritic disorders manifested as localised swelling at the metatarsophalangeal joint of the little toe, pseudogout or chronic gouty pouch could be suggested; although the same location in the fifth toes of all figures with no further systemic involvement is a slightly unusual location for joint involvement in these types of diseases. A systematic and widespread representation of a localised infection, tumours and post-traumatic sequelae seems unlikely but should be taken into consideration. Previous authors have suggested that the depicted anatomical variations are realistic details of real persons, documenting a dominantly inherited

malformation within a family or deformities due to an acquired disease. This hypothesis regarding the presumptive depiction of congenital malformation is not easily tenable, as the number of abnormalities is too high, as shown in this investigation.

Although the painters worked in contact over a long period of time, their production was limited to different cities. One could allow that these artists were lifelong dependents on one and the same genetic pool of models, providing at least a few different subjects for them in very different towns and periods of their artistic life. But it seems that even the most fervid imagination could not imagine that early 16th century Italy was drastically populated with extra-digitated, foot-deformed individuals! Therefore, it seems unlikely that the presence of these deformities can be explained by assuming they are based on models from the same family. In addition, the hypothesis of using real models with real diseases including acquired deformities is hardly accepted because of the high number of relevant canvases and the different types of subjects involved.

The abnormal prominences on the outside of the foot that have been depicted in varying degrees throughout the presented paintings may be the efforts of the artists, particularly Raphael, to study the tridimensionality of the foot in different positions rather than a deliberate attempt to represent a disease. The hypothesis that the deformities were introduced as a visual illusion to optimise proportions seems unlikely because only close examination shows the anomalies. In particular, the detailed preliminary studies made before every work, through cartoons, drawings, sketches or designs, suggest that such unnatural depictions were not repeatedly committed by accident, especially because such accidents could be adjusted in the final piece. Renaissance painters were masterful draftsmen, whose propensity for drawing anatomical structures improved with time, particularly after their exposure to Florentine and Roman artists. The five artists discussed here were thus perfectly capable of adding these anatomical features without a reliance on models.

Albury and Weisz presented a couple of further possible explanations for the depiction of the foot deformity in Renaissance paintings.^{2,19} On the one hand, there was a tendency to depict subjects in some instances, especially saints, with some physical anomaly so that they could be recognised within the portraits. This concept was discussed and adequately analysed by Charles Hope.²⁰ A significant example is St Roch who has been depicted affected by plague buboes.²¹ On the other hand, Albury and Weisz suggested that the cult of St Joseph that began two centuries earlier increased in the 15th century, necessitating somehow his symbolic celebration as a martyr because of his life of sacrifices for Christ and the Virgin.¹⁹ Painters found a subtle manner of expression in

the deformity of the foot of Joseph (Figs 1A, 2D, 4B, 4C) who guided his family away from Nazareth towards Egypt during the Massacre of the Innocents by King Herod. The paintings in this study show St Joseph and his feet during the nativity period before the trip to Egypt. According to Albury and Weisz, the depiction of St Joseph as affected by external foot prominence may have been an attempt by the painters to add the sign of the martyrdom of Joseph and signify his tenacity during the escape from Nazareth to Egypt. Joseph undertook the trip back and forth from Nazareth to Bethlehem or Jerusalem on his feet while his family rode on a donkey. Interestingly, Albury and Weisz proposed that the representation of St Joseph's foot deformity as a gouty prominence was a way to magnify the representation of burden by adding the pain of the metabolic disorder to that given by the stressful physical efforts.¹⁹ The depiction of the foot of St John the Baptist (Figs. 1B, 1F, 3D) affected by the lateral prominence may also support this theory.

We agree with the authors that the depiction of the bare feet of other saints and angels (Figs 2A, 2D, 3A, 3D, 4A), who have the same foot deformity as St Joseph and St John the Baptist, can be considered part of the symbolism and allusion to the sacrifices and martyrdom of Joseph and John^{19,22} and a representation of poverty and humility. Also the depiction of the deformity in the feet of the Virgin and Christ (Figs. 1B–F, 2A–C, 3A–C, 4C) may be contextualised in this way, although the interpretation is more difficult. The sign of the martyrdom was depicted almost equally on the right or left foot in the figures included in the present investigation, therefore we cannot speculate further about the predominance of one side to the other. The decision to emphasise the martyrdom of this saint with the deformed foot, which, during the Renaissance, was considered the humblest part of the body, may be read as a further sign of humility.¹⁹

CONCLUSIONS

A systematic review of the paintings of five Renaissance artists reveals anatomical variations in the depiction of feet. The possible iconographical attributes and the medical-historical meaning of such variations, the possibility of artistic licence and real representation that drove the painters to depict these deformities has been explored and debated. The overview of Renaissance works provided by our investigation again underlined the close association that existed between the visual arts and the careful study of both normal and diseased anatomy and the high level of skill that painters reached in the Renaissance era.

A more detailed survey of the biographies of the aforementioned painters combined with a deeper analysis of the historical context and of their works using under-surface scans would shed further light on the subject.

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