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## Introduction

J. COLIN DAGNALL

*This condition [hallux valgus] is peculiar to civilized man except in isolated cases where it is the result of direct violence to or disease of the metatarsophalangeal joint. Its most frequent cause is the habitual wearing of a pointed shoe.*  
—Otto F. Schuster<sup>1</sup>

*The etiology of hallux valgus may include congenital, arthritis, hereditary (most common), biomechanical and trauma. The deformity usually progresses due to the biomechanics of walking. Shoes as an etiology is a myth.*  
—Lawrence B. Harkless and Steven M. Krych<sup>2</sup>

When I first thought about my approach to the history of hallux valgus surgery, the task seemed relatively easy. The problem would involve taking the vast literature and condensing it into only a few pages. My approach to the history of hallux valgus surgery was to be a traditional one, a biographic, chronologic, and bibliographic study. The more I considered this approach, however, the more uncertain I became. Thus, I have started with two quotations that demonstrate the controversy involving the etiology of hallux valgus. Two opposing viewpoints exist—that the etiology of hallux valgus is the habitual wearing of pointed shoes, and that the etiology includes hereditary, congenital, biomechanical, and traumatic causes, but not the wearing of shoes—and over the years, studies have found evidence to support both claims (see Ch. 3).

As Kelikian<sup>3</sup> has noted, "a staggering number of articles" have been written on the etiology of hallux valgus, and in wading through what has been written, one finds a number of stock statements that need reappraisal. Kelikian writes<sup>6</sup>:

The literature is cluttered with numerous conjectures

concerning the causation of malformed toes; greater emphasis is being placed on evolutionary antecedents and on heredity, and less on civilized habits. It has become fashionable to overlook the obvious—shoes as one of the major causes of malformed toes—and indulge in conjectures. Theories that are not universally accepted by professional anthropologists and embryologists have been flaunted by clinicians as established facts. It is understandable that the sophomore sibling who wanted to follow the footsteps of Darwin or Bardeen, but somehow got sidetracked into the unglamorous avocation of treating twisted toes, should—out of sheer nostalgia or in response to the secret whisperings of his suppressed desire—attempt to relate his thought with those of his student-day idols. There is nothing wrong in trying to connect clinical observations with the general body of scientific knowledge, provided that he who attempts such correlation is well versed in both fields, or at least has studied the pros and cons of the controversial question. When the clinician starts with a fixed idea and seeks confirmation in the work of a scientist, he is liable to be misled, and if influential, in his turn mislead others.

An influential orthopedic surgeon started the trend in the twenties; he surmised that hallux valgus—

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rather, metatarsus primus varus—might be a 'reversion to the branch-grasping Simian type great toe, described by Morton.' He did not seem aware that Morton's theory had been subjected to severe criticism by more than one professional anthropologist. He also suspected 'a persistence of the embryo great toe, described by Lebloc' and did not appear to have taken sufficient pain to spell embryologist Leboucq's name correctly.

Many theories have been published regarding the etiology of hallux valgus. The influence of footgear is commonly cited as a factor in its development, and the classic explanation is "that the toes are pressed out of position by wearing tight or pointed shoes," but Wiles (1949)<sup>4</sup> noted that "in recent years there had been marked improvement in the design of children's footwear and an increasing awareness amongst parents of its importance, but no corresponding decrease in the incidence of hallux valgus."

No definitive study on the etiology of hallux valgus exists, and other factors including biomechanics, arthritis, and trauma have all been considered to be the cause. Root (1977)<sup>5</sup> stated that hallux abducto valgus "is an acquired deformity caused by abnormal mechanics at the first metatarso-phalangeal joint which occurs during the propulsive period of the stance phase of gait."

The cause of hallux valgus may be multifactorial with footwear a contributing factor in a foot that is predisposed to develop hallux valgus.<sup>6</sup>

... up to this point we have carefully avoided facing up to the influence of footwear upon the great toe, but inexorably it appears as though we must be driven back to the ideas which for a long time were considered to be unscientific and unfashionable. That is not to suggest that we throw overboard all the ideas which have been gathered over the years. Many of these are indeed complementary, and it is probable that we shall eventually agree that there is no one, all-embracing, cause of hallux valgus, even though we are at the same time forced to agree that footwear is the trigger that fires the gun. 'No footwear, no hallux valgus' is extraordinarily difficult to refute, and all evidence we have points to the fact that the greater the delay in starting footwear, the greater the chance of escaping hallux valgus, or at least the longer will its onset be delayed.

## TREATMENT OF HALLUX VALGUS

If one were to list all the procedures that have been described for the correction of this deformity of the great toe, one would not contribute anything to the total of human endeavor but would confuse the issue even further."

Volkman (1856) "complained that the 'affection' that 'not only deforms the foot in a most clumsy way but also makes the gait uncertain and continuous walking painful' had not received from surgeons the attention it deserved. According to their social status, patients with what we now call hallux valgus were relegated to barbers to have their calluses trimmed, or to bootmakers to have their shoes adjusted. Hallux valgus was considered as belonging to a 'low class of surgery.'"<sup>3</sup>

Treatment of hallux valgus includes both conservative and surgical procedures. "The future of the treatment of many of the common disabilities of the foot lies, doubtless, in re-education of function rather than in reinforcement by mechanical contrivances or more drastic treatment by the refinements of surgical technique."<sup>8</sup>

Surgical techniques for the treatment of hallux valgus have existed since the 1800s and include arthroplasty, osteotomies, and joint destructive procedures. "Metcalf (1912) summarized 15 different operations; Timmer (1930) mentioned 25; Verbrugge (1933) outlined 51; Perrot (1946) counted 68; and McBride (1952) named 58." McBride wrote that such a variety of methods "can mean but one thing, namely that hallux valgus is a recalcitrant disorder."<sup>3</sup> Kelikian<sup>3</sup> argues:

This is a discreet understatement, not the whole truth. Most surgical procedures on record have scant, extremely tenuous, often untenable principles to support them. A number of operations are possible only on paper, in drawings or blueprints. Behind some of them lurks the desire of the progenitor to perpetuate his name by linking it to a supposedly new method. Lack of historical perspective might have led some of these authors to claim originality for a procedure that had been tried in the past and justly or unjustly relegated to limbo. Frequently one favored technique is applied to all grades of deformities: the cases are not objectively studied and surgically individualized.

Although I am not a surgeon. I recognize that podiatric surgeons have done much to ensure that hallux valgus no longer belongs to a "low class of surgery." Each case must be objectively studied and surgically individualized. The foot remains a vulnerable part of the body on which to operate, and hallux valgus remains a "recalcitrant disorder." The lesson the surgeon can learn from the history of hallux valgus is, first, do no harm. Although the present trend is to discount the role of footwear in the etiology of hallux valgus, history shows us that a foot in the years following surgery is in need of the right shoe for the right occasion.

### PALLIATIVE METHODS OF TREATMENT OF HALLUX VALGUS

From ancient times, the bursal cyst (and often an overlying corn or a keratotic plug in the sinus) associated with hallux valgus received treatment. Theodorice (1267)<sup>9</sup> taught that "it should be excavated all around, and then extirpated down to its roots . . . afterwards the spot cauterized." Many writers subsequently described the many variations of ways to remove the corn or plug and reduce the bursitis.

Durlacher (1845)<sup>10</sup> gave a rational approach that still stands:

The best mode of treatment in such a case would be to reduce the inflammation by rest, and by the application of cold lotions, after which the corns may be carefully extracted, and a plaster, made with soap cerate and adhesive plaster, applied over the joint. If the great toe is inclined obliquely towards the others, a piece of sponge, or a pledget made with tape or linen of sufficient thickness, should be placed between the first and the great toe, so as to bring the latter in a parallel line with the joint and the metatarsal bone. In this manner, the patient wearing a properly-made shoe, a cure may be soon effected, but the plaster must be retained over the joint for some time after the pain and inflammation have subsided.

In the treatment of the corn and its underlying sac, or to destroy the sinus, Durlacher considered the use of silver nitrate to be a specific.

In the nineteenth century, there was much interest in mechanical devices to influence the deformity. Peck

(1871)<sup>11</sup> followed Meyer's (1863)<sup>12</sup> work and wrote, overconfidently, on "how distorted great toe can be straightened." Many were the springs, protective pads, splints, and toe posts in shoes. Much physical therapy was tried; Thomsen (1944)<sup>13</sup> discussed, exhaustively, exercises to mobilize the toes and correct established deformity. His book also had a lengthy section on corrective shoes and supplementary appliances. American and British chiropodists developed to a fine art the palliative treatment of the bursitis and the fabrication of replaceable protective devices; Runting (1925),<sup>14</sup> Woolf (1937),<sup>15</sup> and Budin (1941)<sup>16</sup> can be consulted with profit today. When surgery is not considered appropriate, or is not acceptable to the patient, the condition can be stabilized and the patient rendered symptom free.

### DEVELOPMENT OF HALLUX VALGUS SURGERY

Before the introduction of anaesthesia (general in 1846; local in 1884), and the work of Lister from 1867, using antisepsis and then asepsis to reduce the risk of infection, operating on the joint was both agonizing for the patient as well as hazardous in the extreme.

One of the earliest hints of a definitive surgical approach to hallux valgus was given by Boyer (1826)<sup>17</sup> when he recommended ablation of the "cyst." In 1836, Fricke (1837)<sup>18</sup> operated on two cases of "exostosis of the ball of the foot . . . excision of the bones which form the metatarsodigital joint of the great toe was performed with great success." Resection of the joint was subsequently reported by Pancoast (1844),<sup>19</sup> Hilton (1853),<sup>20</sup> and Butcher (1859).<sup>21</sup> Rose (1874)<sup>22</sup> also removed the sesamoids in addition to the resection of the head of the first metatarsal and the base of the proximal phalanx. Nelaton (1859)<sup>23</sup> recommended tenotomy of the long extensor of the great toe, and thus set the scene for subsequent tenotomies and tendon transplants of infinite variety.

Others must have done so before, but Reverdin (1881)<sup>24</sup> popularized the removal of just the so-called exostosis alone. He was not satisfied with the result, and then did in addition an osteotomy through the distal portion of the first metatarsal. The base of the wedge of bone removed was directed medially and its apex touched the lateral cortex; the toe was straight-

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ened and the capital piece was sutured to the shaft. Subsequently, many surgeons experimented with many similar techniques, but few mention Reverdin. Broca (1852)<sup>25</sup> performed an arthrodesis of the first metatarsophalangeal joint for hallux valgus. He stressed the importance of judging the angle at which the joint is fixed, to allow a measure of dorsiflexion.

There are several versions as to who first put into practice resection of the proximal part of the proximal phalanx of the hallux, but Keller (1904)<sup>26</sup> generally gets the credit. In a second paper 8 years later, Keller<sup>27</sup> reported the results of 26 operations (a surprisingly small series); he adopted an eyebrow incision and removed more of the exostosis. Ironically, considering that this operation became a standard procedure, Keller was not very interested in it and went on to work in general surgery.

Mayo (1908)<sup>28</sup> removed the head of the first metatarsal, and used a locally fashioned fascial flap to cover the denuded articular end of the remodeled bone. Holden (1954)<sup>29</sup> wrote:

When there is severe deformity of the hallux and other toes, the Keller procedure gives poor results. In selected cases, arthrodesis of the first metatarsophalangeal joint, with correction of toe deformities and excision of the displaced metatarsal heads, gives gratifying results.

The work that followed Keller and Mayo indicates the versatility of the human imagination. The many contributions to the treatment of this recalcitrant problem made by podiatric surgeons are set out in this volume. Humility, clinical judgment, careful assessment of the individual patient, and delicate operating technique are required, rather than the invention of ever more "new" procedures.

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