

# Venous thromboembolic disease in hallux surgery

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## Abstract

**Introduction:** Hallux surgery is the most commonly performed elective surgery in the foot and ankle. As with all surgery, there are many potential complications quoted in the literature. Venous thromboembolism (deep vein thrombosis and pulmonary embolism) prophylaxis, however, is not adequately addressed and remains controversial.

**Materials and method:** This prospective study includes 100 patients who underwent hallux surgery. Risk factors implicated to increase the risk of developing venous thromboembolic disease as well as anaesthetic time, thigh tourniquet time and regional anaesthetic blocks were documented. Compressive ultrasonography was performed in all the patients post-operatively.

**Results:** There was one incident of calf deep vein thrombosis (DVT). No patient developed a pulmonary embolus. The one patient who developed a DVT was not at any higher risk than the average patient in the study.

**Conclusion:** As a result of the low incidence of venous thromboembolic disease in this study, the authors do not recommend the routine use of chemical venous thrombo-prophylaxis in patients undergoing hallux surgery. The decision to give post-operative anticoagulation remains the surgeon's responsibility. The duration of prophylaxis will depend on when the patient is fully mobile.

**Level:** 2

**Key words:** hallux surgery, venous thromboembolism

## Introduction

Hallux surgery, with its varying degrees of complexity, is the most common elective surgery performed on the foot and ankle.

The complications and potential risks of hallux surgery in general, are well described in standard text books. However venous thromboembolism (deep vein thrombosis and pulmonary embolism) is inadequately addressed. There is a paucity of discussion in current literature with few prospective studies which are limited to hallux valgus surgery.<sup>1,2</sup>

In related articles, the incidence of venous thromboembolism (VTE) is mentioned as a complication in hallux valgus surgery.<sup>3-6</sup>

Radl *et al.* found an incidence of 4% deep vein thrombosis (DVT) and concluded that the risk of post-operative DVT should be assessed according to patient-related risk factors. They highlighted that patients over the age of 60 years may benefit from medical prophylaxis.<sup>1</sup> This is in keeping with several other studies.<sup>7-14</sup>

There is also data to show that the incidence is even lower.<sup>2</sup>

Besides age, many other risk factors have been implicated in venous thromboembolic disease (*Table 1*).<sup>7-22</sup>

The purpose of this prospective study was to determine the incidence of VTE and hence the need for chemical prophylaxis in hallux surgery.

## Materials and method

The inclusion criteria were all consecutive patients requiring hallux surgery (hallux valgus correction, first metatarsophalangeal joint [MPJ] replacement and first metatarsophalangeal joint arthrodesis), from 2011 to 2013. All patients were 18 years and older.

Exclusion criteria were patients already on anticoagulants, previous venous thromboembolic disease and patients requesting anticoagulation.

Human Research Ethics Committee (Medical) approved the study (Clearance Certificate M110625).

All patients completed a 'Thrombosis Risk Factor Assessment' form, which has been endorsed by the Southern African Society of Thrombosis and Haemostasis (SASTH) (*Figure 1*).

*The purpose of this prospective study was to determine the incidence of VTE and hence the need for chemical prophylaxis in hallux surgery*

**Table 1: Risk factors implicated in venous thromboembolic disease<sup>7-22</sup>**

- Increasing age
- Immobility within 30 days
- Obesity
- Cancer
- Past history of VTE
- Varicose veins
- Orthopaedic surgery
- Low cardiac output state
- Paralysis (stroke, spinal cord injury)
- Hormone replacement therapy/oral contraceptive pill
- Thrombophilia
- Major trauma
- Pregnancy
- Surgery within three months
- General anaesthetic
- Recent history of air travel 8 hours or less
- Major general surgery
- Hindfoot surgery
- Hypertension
- Absence of full post-operative weight bearing
- Smoker and ex-smoker
- Family history of VTE
- Intravenous drug use
- NWB + immobilisation
- Focal leg inflammation
- Steroids
- Alcoholism
- Duration of surgery
- Post-operative infection
- Tourniquet time
- Drugs
- HIV
- Psoriasis

History of smoking, anaesthetic time, thigh tourniquet time and regional anaesthetic block were recorded, in addition to the above risk factors.

One hundred (92 females and eight males) consecutive patients (146 feet) were eligible for inclusion. The mean age was 54.1 years (range 18 to 79 years). Clinical examination for DVT was performed post-operatively while in hospital and at every follow-up visit (at 1, 2, 4, 6 weeks).

All patients were routinely subjected to compression ultrasonography<sup>23</sup> between two and six weeks post-operatively.

## Results

There were 130 hallux valgus corrections (viz. Lapidus [34]; proximal open wedge [13], scarf [18], chevron [67] and Akin [76] osteotomies), 10 hallux MPJ arthrodesis and 6 MPJ replacements.

Associated forefoot surgery (viz. hammer toe and mallet toe corrections; interdigital neuroma excision; Weil osteotomies; bunionette resections and interphalangeal fusion) was performed in 38 patients.

Regional blocks were used in 146 limbs (72 popliteal and 74 ankle blocks) in conjunction with the general anaesthetic.

Average anaesthetic time was 108 minutes (range 45 to 210 minutes) and average thigh tourniquet time was 59 minutes (range 20 to 135 minutes).

The total risk factor score was 5.1 (range 2 to 10). The total risk factor score is the score that determines the risk of developing a DVT. This is calculated from the thrombosis risk factor assessment form. The higher the score, the higher the risk.

There was one (1%) incident of a symptomatic DVT (calf) one week post-operatively. Our one patient who developed a DVT was a female who had a unilateral Lapidus procedure and an associated interdigital neuroma excision. The anaesthetic time was 105 minutes and tourniquet time 94 minutes. Her total risk factor score was 4. Her risk factors were age (54 years),  $BMI > 25 \text{ kg/m}^2$  and length of surgery (greater than 45 minutes).

No patient developed pulmonary embolus.

Post-operatively all patients were mobilised on day one in a post-operative wedge heel shoe allowing them to bear weight on the heel as tolerated. No cast was used. This protocol included the patients who had bilateral surgery.

## Discussion

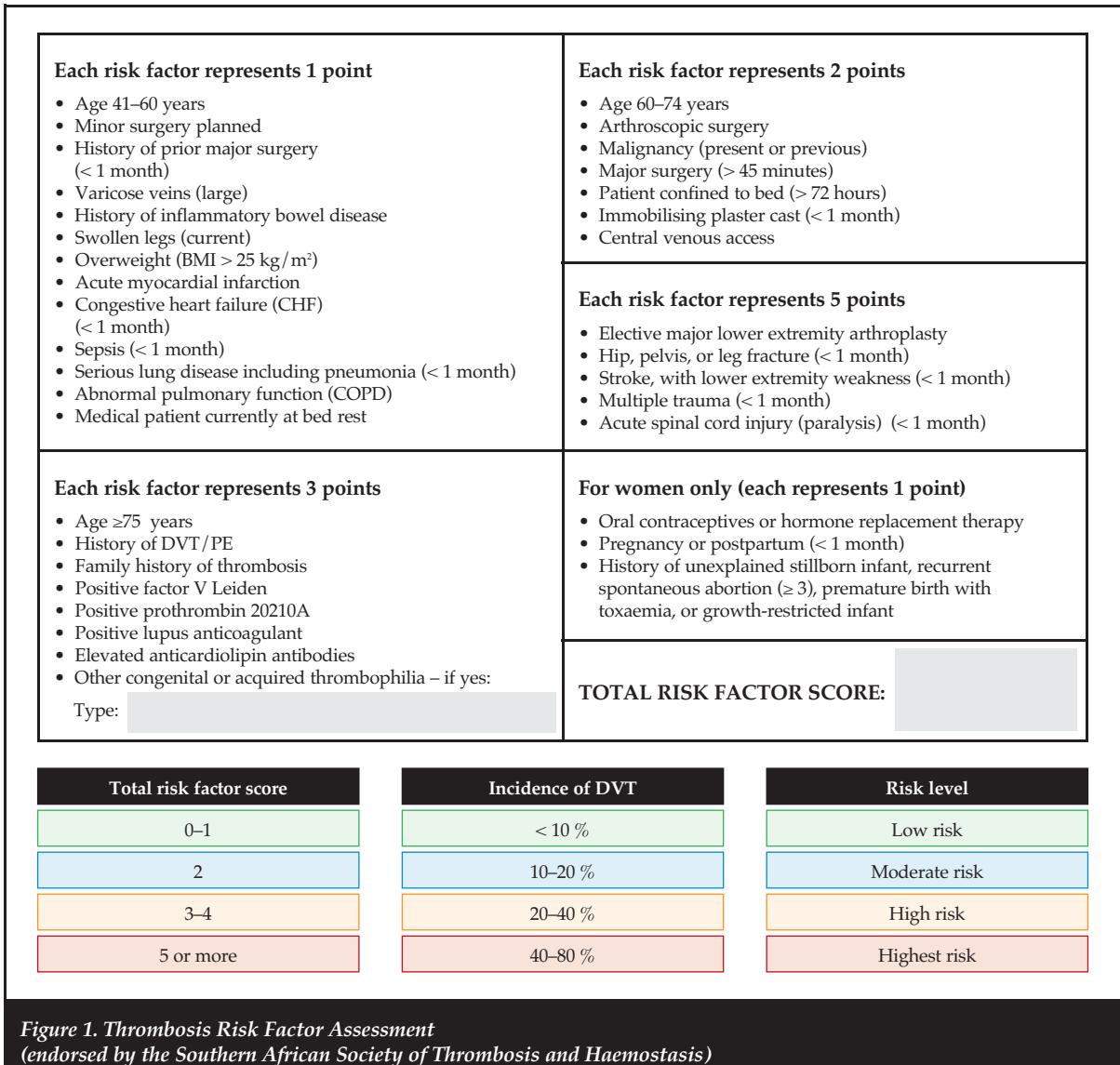
Seventy-seven per cent of hip and knee surgeons routinely use thromboprophylaxis.<sup>24</sup>

This is understandable due to the high prevalence of DVT in total hip replacements (42–57%) and total knee replacements (41–85%).

In foot and ankle surgery, however, there is no consensus on the use of chemical thromboprophylaxis and there are no clear guidelines. This is particularly true for hallux surgery. This study has found a very low incidence of VTE.

In general, the recommendation for thromboprophylaxis is a total risk factor score of 5 or more, 5 being at the highest risk for developing DVT (incidence of 40–80%).<sup>7,25</sup>

Despite an average total risk factor score of 5.1, the incidence of DVT in our study group was very low (1%).



**Figure 1. Thrombosis Risk Factor Assessment**  
(endorsed by the Southern African Society of Thrombosis and Haemostasis)

The authors feel that routine chemical thromboprophylaxis in hallux surgery per se is not warranted.

Individual patient specific risk factors, however, need to be assessed pre-operatively and measured against a validated scoring system. The decision to give post-operative anticoagulation remains the surgeon's responsibility, as large scale, prospective clinical trials are unlikely to be carried out due to financial constraints.

The duration of cover will depend on when the patient is fully mobile.

## Conclusion

This current study does not recommend the routine use of chemical thromboprophylaxis in hallux surgery.

The emphasis therefore, is placed on individual, patient-specific risk factors. Furthermore, the total risk factor score guidelines may need to be revised in hallux surgery by increasing the sensitivity of the total score.

There is a need for larger prospective studies to identify the patient undergoing foot and/or ankle surgery who is a potential risk.

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