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Role of Anticoagulation in Reducing Post Operative DVT Following Major L.L Amputation (Prospective Clinical Trial)

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Abstract

Background: Postoperative vein clots.

Aim of Study: The aim of the study: was to estimate the role of Anticoagulation in Reducing Post-Operative DVT Following Major L.L Amputation.

Patients and Methods: The current study was carried on 35 patients whom underwent lower limb amputation and followed up for incidence of DVT. They were divided into two groups according to occurrence of DVT: No DVT group (n = 22), DVT group (n = 13). The expected period of the study is 6 months, started from January 2024 to June 2024.

Results: There is no significant difference in age between the groups with and without deep vein thrombosis (DVT). The no-DVT group consists of 50% females and 50% males, while the DVT group has 46.2% females and 53.8% males. The mean BMI for the group without DVT is 27.69, compared to the DVT group with a mean BMI of 32.67. A significant difference in the distribution of smokers and non-smokers between the groups There is statistically significant difference in the incidence of DVT between the two surgery levels. There is statistically significant difference in the causes of amputation between the two groups. there is no statistically significant difference in the side of amputation between the two groups. Out of the 13 patients with DVT, the femoral segment was affected in 53.8% of cases. The popliteal segment was involved in 38.5% of cases, while the femoropopliteal segment was the least affected, with only 7.7% of cases. At 3 weeks, 69.2% of the patients (9 out of 13) were observed to have DVT, while 30.8% (4 out of 13) did not exhibit signs of DVT. However, by 8 weeks, the situation appears to reverse, with the majority (69.2%) no longer showing signs of DVT and only 30.8% still having DVT. There is statistically significant difference between the two groups regarding the distribution of DVT venous segments.

Conclusion: The study results-suggests that patients with above-knee amputations are more likely to experience DVT in the femoral segment compared to those with below-knee amputations. The high incidence of DVT in patients who underwent AKA is probably because the femoral vein is a conduction vessel with few tributaries, a feature that leads to poor venous flow in its remnant segments and consequent thrombosis.

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Key Words: *Anticoagulation – Post Operative DVT – Major L.L Amputation.*

Introduction

VENOUS thromboembolism (VTE) is a disease that includes both deep vein thrombosis (DVT) and pulmonary embolism (PE). It is a common lethal disorder that affects hospitalized and non-hospitalized patients, and results in long-term complications including chronic thromboembolic pulmonary hypertension (CTPH) and post thrombotic syndrome (PTS). Venous thromboembolism results from hereditary or acquired risk factors, also known as thrombophilia or hypercoagulable states. In addition, vessel wall damage, venous stasis, and increased activation of clotting factors first described byRudolf Virchow more than a century ago remain the fundamental basis for our understanding of thrombosis **[1].**

Venous thromboembolism is the third most common cardiovascular illness after acute coronary syndrome and stroke. Although the exact incidence of VTE is unknown, pulmonary embolism is the third most common cause of hospital-related death and the most common preventable cause of hospital-related death **[2].**

In the European Union, It has been noted that VTE is responsible for more than twice the number of deaths than those caused by AIDS, breast cancer, prostate cancer and road traffic accidents combined **[3].**

Symptoms of DVT may include: Swelling in foot, ankle, or leg, usually on one side. Cramping pain in the affected leg that usually begins in the calf. Severe, unexplained pain in the foot and ankle. An area of skin that feels warmer than the skin on

the surrounding areas. Skin over the affected area turning pale or a reddish or bluish color **[4]**.

DVT in the amputated lower limb may present without any local symptoms or signs. Chest pain, dyspnea and palpitation may be the only presenting symptoms as an indicator of occurrence of pulmonary embolism (PE). The patient may also present by local symptoms such as stump pain, redness and swelling **[5]**.

VTE can lead to serious long-term complications, including post-thrombotic syndrome (PTS) and thrombo-embolic pulmonary hypertension (CTPH). PTS is the most common complication of DVT and typically causes chronic pain and swelling in the affected leg, and in severe cases can result in venous ulcers. After symptomatic DVT, 20–50% of patients develop PTS **[6]**.

Duplex ultrasonography of the lower extremity has become the first-line diagnostic test to detect DVT, with a sensitivity of 91% to 96% and a specificity of 98% to 100% **[7]**.

Lower extremity amputation ranging from toe amputation to hip disarticulation offers an assortment of treatment options for a multitude of diseases including limb ischemia, infection and major trauma. Above-knee amputation and below-knee amputation are frequently performed and dramatically impact a patient's life. Understanding key principles allows for better prediction of the correct level of amputation for the patient while maintaining the maximal functionality that can be offered. Many opportunities exist to more accurately predict and allow for improved wound healing and functionality. Following lower extremity amputation, the risk of DVT is up to 50% **[8]**.

In the present prospective study, we document the incidence of DVT complicating major lower extremity amputation using Doppler ultrasonography and assess using prophylactic anticoagulants (direct oral anticoagulants DOACs) to reduce risk of DVT in such patients.

Aim of the work:

The aim of this study is to prospectively document the role of Anticoagulation in reducing post-operative DVT following major lower limb amputation.

Patients and Methods

Single arm prospective clinical trial on role of anticoagulants in preventing of DVT in patients with major lower limb amputation. Anticoagulants are effective in preventing DVT and improving morbidity. 35 Patients recruited from Ain Shams University (El Demerdash), El Sahel teaching hospital and other authorized hospitals under supervision of thesis supervisors. The expected period of the study is 6 months, started from January 2024 to June 2024.

Inclusion criteria:

Both male and female patients who need major lower extremity amputation (BKA or AKA) for any possible cause (sever infection, critical limb ischemia, major trauma .... etc), age between 18-55 years, preoperative mobile patients, normal hemoglobin level, platelet count, Albumin level, Coagulation profile, renal and liver function tests.

Exclusion criteria:

History of thromboembolic hereditary disorders, bed ridden patients not fit postoperatively for application of a prosthesis, any contraindications for anticoagulation therapy, obesity (body mass index $>30 kg/m^2$) and malignancy.

Outcomes:

The primary endpoint is assessing incidence of deep venous thrombosis following major lower extremity amputations with using of prophylactic anticoagulation (apixaban 5mg twice daily) starting from the first day postoperatively and continued for 8 weeks.

Study tools:

Doppler ultrasonography (8 weeks postoperatively), complete history taking, clinical evaluation and analysis of the results.

Statistical analysis:

The collected data was revised, coded, and tabulated using the Statistical package for Social Science (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0.Armonk, NY: IBM Corp). Data were presented and suitable analysis was done according to the type of data obtained for each parameter. A *p*-value is considered significant if <0.05 at confidence interval 95%.

Results

The current study was carried on 35 patients whom underwent lower limb amputation and followed up for incidence of DVT.

Regarding the comparison between studied groups according to age in Table (1), the statistical data shows that there is no significant difference in age between the groups with and without deep vein thrombosis (DVT). The mean age for the no-DVT group is 40.23 years with a standard deviation of 6.84, while the DVT group has a mean age of 42.23 years with a standard deviation of 9.36.

In Table (2), which assesses the distribution of gender across groups with and without deep vein thrombosis (DVT), the results demonstrate an almost equal distribution between males and females. The no-DVT group consists of 50% females and

50% males, while the DVT group has 46.2% females and 53.8% males.

The mean BMI for the group without DVT is 27.69, compared to the DVT group with a mean BMI of 32.67. The *t*-test result shows a highly significant difference ($p<0.001$).

The data shows a significant difference in the distribution of smokers and non-smokers between the groups. In the no-DVT group, 72.7% are non-smokers and 27.3% are smokers. In contrast, the DVT group has 23.1% non-smokers and 76.9% smokers. The Chi-square test result indicates a statistically significant difference in the proportion of smokers between patients with and without DVT ($p=0.006$).

Table (5) presents the incidence of deep vein thrombosis (DVT) comparing below-knee amputation (BKA) and above-knee amputation (AKA) groups at 3 weeks and 8 weeks post-surgery. At 3 weeks, the incidence of DVT in the AKA group is significantly higher at 88.9% (8 out of 9), compared to 25.0% (1 out of 4) in the BKA group, with a *p*-value of 0.022, indicating a statistically significant higher risk of DVT in AKA patients shortly after surgery. Conversely, by 8 weeks, the situation reverses; the BKA group shows a higher incidence of DVT at 75.0% (3 out of 4), while the incidence dramatically decreases in the AKA group to 11.1% (1 out of 9), also with a *p*-value of 0.022.

Table (1): Comparison between studied groups according to age.

	No DVT n=22	DVT n=13	Test Result
Age (years):			
Mean ± SD	40.23±6.84	42.23±9.36	*t*: 0.717,
Median	37.00	45.00	*p*=0.483
(Min-Max)	(31.00-52.00)	(29.00-54.00)	

t: *t*-student test.

Table (2): Comparison between study groups according to Gender.

	No DVT n=22	DVT n=13	Test Result
Gender:			
Female	11 (50.0%)	6 (46.2%)	X^2: 0.000,
Male	11 (50.0%)	7 (53.8%)	*p*=1.000

X^2: Chi square test.

Table (3): Comparison between studied groups according to BMI.

	No DVT n=22	DVT n=13	Test Result
BMI (kg/m^2):			
Mean ± SD	27.69±1.71	32.67±1.21	*t*: 9.196,
Median	27.65	32.19	*p*<0.001*
(Min-Max)	(25.31-30.83)	(30.97-34.73)	

t: *t*-student test.

Table (4): Comparison between study groups according to special habits.

	No DVT n=22	DVT n=13	Test Result
Special habits:			
Non smoker	16 (72.7%)	3 (23.1%)	X^2: 4.113,
Smoker	6 (27.3%)	10 (76.9%)	*p*=0.006*

X^2: Chi square test.

Table (5): Comparison between surgery level groups according to Incidence of DVT.

	BKA n=4	AKA n=9	*p*
Incidence of DVT After 3 w	1 (25.0%)	8 (88.9%)	0.022*
Incidence of DVT After 8 w	3 (75.0%)	1 (11.1%)	0.022*
Total	4 (100%)	9 (100%)	–

Test: Fissure exact test.

Discussion

Patients undergoing surgery have an increased risk of developing blood clots in their veins. These clots may be in the deep veins of the leg (deep vein thrombosis (DVT)) or travel to the lungs [pulmonary embolism (PE)]. Venous thromboembolism (VTE) is the combined term for DVT and PE. Prevention of these blood clots (prophylaxis) after surgery may reduce the risk of postoperative vein clots. These potential benefits, however, have to be balanced against the associated risks of bleeding. The optimal duration of prophylaxis after lower limb amputation remains controversial **[9].**

It is common practice to administer prophylaxis using drugs such as low-molecular-weight heparin and unfractionated heparin (anticoagulants) until discharge from hospital and for a minimum of seven to 14 days after surgery. Current international guidelines recommend extending prophylaxis for up to 35 days following major orthopedic surgery but recognize that the recommendation is weak due to moderate quality evidence. In addition, new oral anticoagulants (direct oral anticoagulants (DOAC)) show potential benefits such as taking tablets by mouth instead of injection, lack of frequent monitoring and few known drug interactions. Interest in this topic therefore remains high **[10].**

Thus, this study was conducted to estimate the role of Anticoagulation in Reducing Post-Operative DVT Following Major L.L Amputation.

The current study was carried on 35 patients whom underwent lower limb amputation and followed-up for incidence of DVT. They were divided into two groups according to occurrence of DVT: No DVT group (n = 22), DVT group (n = 13).

In relation to Comparison between studied groups according to age the current study mentions that,the mean age for the no-DVT group is 40.23 years with a standard deviation of 6.84, while the DVT group has a mean age of 42.23 years with a standard deviation of 9.36.this result is in dis agreement with Khaled et al. *[11]* who mentioned that The mean age of the patients with DVT was 67.25 ±11.7 years (range, 43 - 88 years) while this result is in line with Xu et al. *[12]* who estimated that the DVT group age ranging in age from 16 to 97 years (66.02±16.72).

Also, Herlihy et al. *[13]* mentioned that the mean age of studied patients was 45±8.8 years (range: 18 to 55 years).

Regarding Comparison between study groups according to Gender.The current study displays an almost equal distribution between males and females. The no-DVT group consists of 50% females and 50% males, while the DVT group has 46.2% females and 53.8% males. This result is in line with Xu et al. *[12]* who mentioned that in their study which comprised a total of 462 patients (46.3%) of both study groups were being female patients. Also, Kennedy et al. *[14]* estimated that Of the 79 patients, there were 52 male and 27 female. Mean age at time of surgery was 72 years (range 34-99 years). Furthermore, Wu et al. *[15]* found that Within the study population, 64% were male, mean age was 66 years,

Additionally Herlihy et al. *[13]* mentioned that in their which study involved 35 patients who underwent to unilateral lower limb amputation. The study participants were 19 males (54.29%) and 16 females (45.71%), with male to female ratio 1.2:1.

In relation to Comparison between studied groups according to BMI. The current study mentioned that The mean BMI for the group without DVT is 27.69, compared to the DVT group with a mean BMI of 32.67. The *t*-test result shows a highly significant difference ($p<0.001$. this result is in agreement with Herlihy et al. *[13]* who found that there was statistical significance between the 2 study group regarding BMI with stander deviation of 28.4±2.6.

Regarding Comparison between study groups according to special habits. The current study data shows a significant difference in the distribution of smokers and non-smokers between the groups. In the no-DVT group, 72.7% are non-smokers and 27.3% are smokers. In contrast, the DVT group has 23.1% non-smokers and 76.9% smokers. The Chi-square test result indicates a statistically significant difference in the proportion of smokers between patients with and without DVT ($p=0.006$). This result is in line with Khaled et al. *[11]* who found that of the 56 patients studied, 37 (66.0 %) were unable to walk before amputation, and 12 (21.4%) were smokers.

Also, In this context, Kim et al. *[16]* found that Risk factorsas smoking habits that may predispose to venous thrombosis among the patients with and without perioperative DVT in which including Patients with a history of venous disease (DVT or chronic venous insufficiency) were at higher risk for perioperative DVT ($p=0.02$). There was a similar trend for patients with preexisting lower extremity amputation ($p=0.08$).

Further-more Wu et al. *[15]* estimated that Most of the patients had cardiovascular comorbidities, with 98% having underlying type 2 diabetes mellitus (T2DM) and only 27% having good diabetic control with HbA1c <7%. Additionally, hypertension was present in 90% of patients, hyperlipidemia in 90%, end-stage renal failure (ESRF) in 33%, and ischemic heart disease in 62%; and 37% were chronic smokers.

Concerning Comparison between study groups according to surgery level, the current study mentioned that In the no-DVT group, both above-knee amputation (AKA) and below-knee amputation (BKA) account for 50% each. Conversely, in the DVT group, 69.2% underwent AKA while 30.8% had BKA. There is statistically significant difference in the incidence of DVT between the two surgery levels.

This result in agreement with Herlihy et al. *[13]* who mentioned that There was statistically significant difference between incidence of DVT and level of amputation, as 5/15 patients (33.3%) underwent BKA developed DVT, while 10/20 patients (50%) underwent AKA, developed DVT, (HR: 1.6,95% CI: 0.4,6.5; p - 0.487).

Also, in similarity with our result Yeager et al. *[17]* found that difference in the prevalence of DVT among their patients undergoing above-knee (4 of 31,13%) compared with below knee amputation (5 of 41, 12%). However, they support the conclusion that DVT is often associated with lower extremity amputation.

This result is dis agreement with Wu et al. *[15]* who found that and 57% of patients underwent BKA of the right leg.

While this result is in agreement with Silva et al. *[18]* who mentioned that the most frequent level of amputation was BKA, in 36 (58.1%) cases. The left lower extremity was the site of amputation in 51.6%. None of the patients underwent knee disarticulation.

Also, Kennedy et al. *[14]* found that four of 31 (13%) patients undergoing above-knee amputation and 5 of 41 (12%) patients undergoing below-knee amputation were found to have DVT. they estimated that Twenty patients (25%) were bilateral amputees at the time of follow-up. Ten patients (13%)

had previously undergone contralateral limb major lower limb amputation prior to the study period, nine (11%) underwent contralateral limb amputation during the study period and at the time of follow-up one (1%) underwent contralateral limb amputation after the study period. Only two patients (3%) underwent revision of below-knee amputation to above-knee amputation and both of these were conducted during the study period Furthermore, Khaled et al. [11] found that Six patients had prior amputations of contralateral limbs (4 BKA and 2 AKA), and two patients underwent bilateral BKA in the same surgery.

In our study, In the no-DVT group, 50.0% of amputations were due to diabetes, 9.1% due to infection, 13.6% due to preexisting venous disease, and 27.3% were traumatic. In the DVT group, 61.5% of amputations were due to diabetes, none were due to infection, 23.1% due to preexisting venous disease, and 15.4% were traumatic. The *p*-value of 0.510 indicates that there is no statistically significant difference in the causes of amputation between the two groups in this context, Van Damme & Limet [19] found that 60-80% of the non DVT amputations are performed in diabetics and there is 15 fold risk of major amputations. The incidence of lower extremity amputation in a diabetic patient can be predicted by assessing various risk factors.

Also, Kyei et al. [20] found that The most common indication for non-traumatic lower limb amputations was diabetic leg ulcers which accounted for 55 (52.9%) of the total amputations. Other indications were gangrene from peripheral arterial disease 42 (40.4%) and malignant conditions of the lower limbs 6 (5.7%). One case (0.9%) of amputation for a nonfunctional limb from severe postburn contracture was recorded.

Furthermore, Wang et al. [21] Indications for amputation included acute ischemia with irreversible muscle, nerve, and cutaneous damage (n = 18, 25%), extensive ulceration or osteomyelitis and soft tissue infection (n = 30, 42%), and chronic ischemia in infirm, bedridden patients (n = 24, 33%).

In our study, in the no-DVT group, 4.5% of amputations were bilateral, 45.5% were on the left side, and 50.0% were on the right side. In the DVT group, 7.7% of amputations were bilateral, 46.2% were on the left side, and 46.2% were on the right side. The *p*-value of 0.920 indicates that there is no statistically significant difference in the side of amputation between the two groups. This result is in consistent with Wang et al. [21] who found that VT involvement was contralateral to the side of extremity amputation in four patients, bilateral in one, and ipsilateral to the amputation in four patients.

In relation to Frequencies of DVT venous segment in DVT group. The current study mentioned that Out of the 13 patients with DVT, the femoral segment was affected in 53.8% of cases, indicating that it is the most commonly affected segment. The popliteal segment was involved in 38.5% of cases, while the femoropopliteal segment was the least affected, with only 7.7% of cases.This result is matched with Argandykov et al. [22] who found that The predominant location of obstructive arterial disease in the amputated limb was the femoropopliteal segment (71%). The prevalence of both iliofemoral and infra-popliteal disease was 14.5%.

Also, In this context, Wang et al. [21] estimated. DVT involvement was contralateral to the side of extremity amputation in four patients, bilateral in one, and ipsilateral to the amputation in four patients. Thrombi were located at or proximal to the popliteal vein in eight patients and were isolated to infrapopliteal veins in one patient.

About Incidence of DVT after 3 weeks in study subjects., the current study the current study estimates that at 3 weeks, 69.2% of the patients (9 out of 13) were observed to have DVT, while 30.8% (4 out of 13) did not exhibit signs of DVT. However, by 8 weeks, the situation appears to reverse, with the majority (69.2%) no longer showing signs of DVT and only 30.8% still having DVT. This result is in agreement with Harper et al. [23] who used contrast venography of the ipsilateraliliofemoral segment and found DVT in 15 (67%) patients after above-knee amputation. Barnes and Slaymaker [24] however, prospectively examined 35 patients undergoing 42 lower extremity amputations (28 below-knee, 14 above-knee) with continuous wave Doppler examinations and were unable to detect a single case of DVT, although one patient had a pulmonary embolus. They found no difference in the prevalence of DVT among patients undergoing above-knee (4 of 31, 13%) compared with below limb amputation (5 of 41, 12%).

In relation to Comparison between surgery level groups according to DVT venous segment. The current study mentions that all patients in the AKA group (100%) had DVT in the femoral segment, while in the BKA group, 33.3% had femoral segment DVT, 11.1% had femoropopliteal DVT, and 55.6% had popliteal DVT. The *p*-value of 0.084, indicates that there is statistically significant difference between the two groups regarding the distribution of DVT venous segments. This result in agreement with Herlihy et al. [13] who found that as regard to diseased venous segment, femoral vein thrombosis was associated with above knee amputation, while popliteal vein thrombosis was associated with below knee amputation.

Regarding Comparison between surgery level groups according to Incidence of DVT. The current study mentions that at 3 weeks, the incidence of DVT in the AKA group is significantly higher at 88.9% (8 out of 9), compared to 25.0% (1 out of 4) in the BKA group, with a *p*-value of 0.022, indi-

cating a statistically significant higher risk of DVT in AKA patients shortly after surgery. Conversely, by 8 weeks, the situation reverses; the BKA group shows a higher incidence of DVT at 75.0% (3 out of 4), while the incidence dramatically decreases in the AKA group to 11.1% (1 out of 9), also with a *p*-value of 0.022.

This result is in line with Herlihy et al. **[13]** who mentioned that 9/15 patients (60%) who underwent AKA developed DVT, while 2/20 patients (10%) who underwent BKA developed DVT, *p*-value = 0.001. After 6 weeks; 3/20 patients (15%) who of BKA developed DVT, while 1/15 patient (6%) of AKA developed DVT with no statistically significant difference (p=0.6), thus emphasize that AKA was associated with early higher incidence of DVT rather than BKA.

Also, this result is in dis agreement with Argandykov et al. (22) who found that by follow up of 28 days, Nine (12.5%) of 72 patients were found to have DVT. Four of 31 (13%) patients undergoing above-knee amputation and 5 of 41 (12%) patients undergoing below-knee amputation were found to have DVT.

Conclusion:

The study results-suggests that patients with above-knee amputations are more likely to experience DVT in the femoral segment compared to those with below-knee amputations. The high incidence of DVT in patients who underwent AKA is probably because the femoral vein is a conduction vessel with few tributaries, a feature that leads to poor venous flow in its remnant segments and consequent thrombosis. Old age (more than 70 years) was another factor related to DVT ipsilateral to the amputation.

Documentation of DVT prevalence is essential to assist surgeons in planning a management strategy for prevention, diagnosis, and treatment of DVT associated with lower extremity amputation.

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دور مضادات تجلط الدم فى منع الإصابة بجلطات الأوردة العميقة بعدجراحات بتر الأطراف السفلية الرئيسية تجربة سريرية مستقبلية بذراع واحدة

المقدمة: يكون المرضى الذين يخضعون لعملية جراحية أكثر عرضة للإصابة بجلطات الدم فى الأوردة. قد تكون هذه الجلطات فى الأوردة العميقة فى الساق (تجلط الأوردة العميقة) أو تنتقل إلى الرئتين (الانسداد الرئوى). الجلطات الدموية الوريدية هو المصطلح المشترك لـ DVT و PE.

الهدف من الدراسة: هو تقدير دور مضادات تخثر الدم فى تقليل الإصابة بتجلط الأوردة العميقة بعد العملية الجراحية بعد بتر الأطراف الكبرى.

المرضى وطرق العلاج: أجريت الدراسة الحالية على ٣٥ مريضاً خضعوا لبتر أطرافهم السفلية وتمت متابعتهم للتأكد من الإصابة بتجلط الأوردة العميقة. تم تقسيمهم إلى مجموعتين حسب حدوث الإصابة بجلطات الأوردة العميقة: لا توجد مجموعة تجلط الأوردة العميقة ن = ٢٢، مجموعة تجلط الأوردة العميقة ن = ١٣.

النتائج: لا يوجد فرق كبير في العمر بين المجموعات المصابة وغير المصابة بتجلط الأوردة العميقة، تتكون المجموعة غير المصابة بجلطات الأوردة العميقة من ٥٠ ٪ إناث و٥٠٪ ذكور، بينما تضم مجموعة الإصابة بتجلط الأوردة العميقة ٤٦,٢٪ إناث و٥٣,٨٪ ذكور، متوسط مؤشر كتلة الجسم للمجموعة التى لا تعانى من الإصابة بتجلط الأوردة العميقة هو ٢٧,٦٩، مقارنة بمجموعة الإصابة بتجلط الأوردة العميقة التى يبلغ متوسط مؤشر كتلة الجسم فيها ٣٢,٦٧، وجود فرق كبير فى توزيع المدخنين وغير المدخنين بين المجموعتين، هناك فرق ذو دلالة إحصائية فى حدوث الإصابة بجلطات الأوردة العميقة بين مستوى الجراحة، يوجد فرق ذو دلالة إحصائية فى أسباب البتر بين المجموعتين، لا يوجد فرق ذو دلالة إحصائية فى جانب البتر بين المجموعتين، من بين ١٣ مريضًا مصابًا بتجلط الأوردة العميقة، تأثر الجزء الفخذى فى ٥٣,٨٪ من الحالات، كان الجزء المأبضى مشتملا فى ٣٨,٥٪ من الحالات، فى حين كان الجزء الفخذى المأبضى هو الأقل تأثرا، بنسبة ٧,٧٪ فقط من الحالات. خلال ٣ أسابيع، لوحظ أن ٦٩,٢٪ من المرضى ٩ من أصل ١٣ مصابون بتجلط الأوردة العميقة، فى حين أن ٣٠,٨٪ (٤ من أصل ١٣) لم تظهر عليهم علامات الإصابة بتجلط الأوردة العميقة.

الاستنتاج: تشيرنتائج الدراسة إلى أن المرضى الذين يعانون من عمليات بترفوق الركبة هم أكثر عرضة للإصابة بتجلط الأوردة العميقة فى الجزء الفخذى مقارنة مع أولئك الذين يعانون من عمليات بترتحت الركبة. من المحتمل أن يكون ارتفاع معدل الإصابة بتجلط الأوردة العميقة فى المرضى الذين خضعوا لـ AKA هو أن الوريد الفخذى عبارة عن وعاء توصيل مع عدد قليل من الروافد، وهى ميزة تؤدى إلى ضعف التدفق الوريدى فى الأجزاء المتبقية من هو ما يترتب على ذلك من تجلط الدم.