Clinically Silent Deep Vein Thrombosis in Patients with Superficial Thrombophlebitis and Varicose Veins at Legs

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SUMMARY
Study comparing the results of Coronary artery bypass grafting (CABG) with and without cardiopulmonary bypass (CPB) in the treatment of left main stenosis (LMS) has not yet been made in Bosnia and Herzegovina. The main aim of this study was to compare result of CABG performed by these methods in LMS group of patients in the early and late postoperative period. The study was divided in two parts. In the first part early postoperative period (30 days after the surgery) have been analysed, which consider results of CABG in 92 patients revascularised without CPB (OPCAB) method (Group A) and 84 patients with LMS revascularised with CPB method (ONCAB, CCAB) (Group B). In the second part late postoperative period (one year after surgery) have been analysed. Patients from both groups have been contacted and interviewed. Total number (276 versus 278) same as average number of grafts per patients (3.0 ±1.45 versus 3.31 ±0.86, p=0.096) was insignificantly higher in group B. Perioperative and postoperative results revealed significant differences between two groups with in the meaning of reduced mechanical ventilation time (2.9 versus 7.3 hours, p=0.039), less blood transfusion requirement (200.3 versus 419.9 ml, p=0.035) and postoperative length of stay (7.4 versus 8.3 days). Inotropic support requirement was significantly higher in group B during the surgery (14.1% versus 29.8%, p=0.019) and postoperative period longer than 12 hours (7.6 versus 22.6%, p=0.009). The most frequent postoperative complication was rhythm disturbance within the definition of atrial fibrillation (23.9 versus 32.1, p=0.295). There was significant difference in mortality in early postoperative period in group A (0.0 versus 5.95%, p=0.023). Recurrent angina was among the most frequent postoperative complications and side effect after coronary artery bypass grafting. Significant differences haven’t been revealed between two groups for total appearance of recurrent angina pectoris (25.0 versus 31.2%, p=0.479), for any of additional procedure (7.9 versus 7.8, p=0.802), for the major complications (8.0 versus 9.1%, p=0.985), for mortality (7.9 versus 5.2%, p=0.692). Patients’ survival after CABG for period of 12, 24, 36 and 48 months after surgery was not statistically significant (97.0 versus 96.1%, p=0.857; 93.2 versus 94.8%, p=0.913; 92.0 versus 94.8%, p= 0.692). In conclusion, CABG for period of 12, 24, 36 and 48 months after surgery was not statistically significant (97.0 versus 96.1%, p=0.857; 93.2 versus 94.8%, p=0.913; 92.0 versus 94.8%, p=0.692). Patients’ survival after CABG was not statistically different in patients operated with or without CPB.

Keywords: coronary artery bypass grafting, LMS, early results of coronary artery bypass grafting, late results of coronary artery bypass grafting

1. INTRODUCTION
Superficial thrombophlebitis is a disease mainly associated with the changes of superficial varicose veins in lower limbs and the state that can have effective treatment with conservative treatment with compressive therapy, activity and non-steroidal anti-inflammatory medications (1, 2). Until recently it was considered that the disease does not cause significant morbidity or mortality. Although pulmonary embolism (PE) is recognized as a complication of superficial thrombophlebitis even before the appearance of modern diagnostic methods for deep vein thrombosis (DVT) (2), causal link between DVT and superficial thrombophlebitis with possible complications of PE came to the center of the current studies. In addition to the natural connection between these two diseases, aspects of treatment are now becoming the subject of controversy and debate. Today we know that concomitant DVT is present in 5–40% of patients with superficial thrombophlebitis, mainly if superficial thrombophlebitis is located at about 1 cm from saphenopopliteal delta (3).

Precise definition of acute DVT incidence is complicated with it clinical “silent” nature in most patients whether they are hospitalized or outpatients, as well as non-specific clinical signs and symptoms (4, 5). Autopsy studies, mainly biased, including very old and sick, indicate DVT prevalence of 35-52% (6, 7, 8), and it is estimated that the incidence of acute DVT in the United States is 250 000 cases annually. This research was mainly based on clinical assessment and diagnosis of DVT.

Recent data show that in the US venous thromboembolism occurs in a hundred to one hundred thousand people per year and increases to five cases per hundred thousand people younger than 15 years, and approximately 500 cases (0.5%) to one hundred thousand people at age of 80 years. The contemporary literature is mentioned several factors that individually or in combination with other factors may cause venous thromboembolism with all its complications. Most often mentioned are: the previous cases of venous thromboembolism, age, major surgical procedures, malignant diseases (manifested or hidden), obesity, injuries, varicose veins, superficial thrombophlebitis, heart disease, hormone replacement therapy, prolonged immobilization, pregnancy, venous catheters, hyper coagulation status (usually resistance to activated protein C) (9, 10). DVT is associated with high degree morbidity and mortality in area of lower limbs thrombosis is one of the most important factors and generally is very common. (11) established a three-month rate of 19%, and that was not caused by PE (12). Reported a similar mortality rate of 21% during the first year after acute DVT, but have found that the survival curves after 1 year of similar age, sex and race.

Increased mortality was observed in patients with DVT located in the upper limbs, which were in general more seriously ill patients with a high prevalence rate of malignancy with metastases (13, 14). Six-month mortality is nearly 48% in patients with DVT located in upper limbs, compared with 13% of patients with DVT located in the lower limbs (13).

The latest researches confirmed that the possible progression of superficial thrombophlebitis located on the lower vein segments in saphene magna (VSM), in the area of perforators above and under the knee (2, 3), and the delta of vein saphene parva (VSP) in popliteal vein in 10% of cases (1). Only clinical testing cannot clearly distinguish superficial thrombophlebitis from phlebitis which has components of DVT and superficial thrombophlebitis. Use of ultrasound identified DVT in approximately 30% of patients with proven su-
peripheral thrombophlebitis, who have clinically proven DVT. However, dynamic phlebography of deep and superficial veins in lower extremities in patients with thrombophlebitis altered varicose subcutaneous veins of lower extremities is the “gold standard” in the early detection of clinically silent deep vein thrombosis.

2. GOAL

The aim of this study was to determine the frequency of clinically silent deep vein thrombosis in the lower extremities in patients with and without superficial thrombophlebitis altered varicose subcutaneous veins in the lower limbs, correlation between superficial thrombophlebitis and deep venous thrombosis, regardless of the localization of superficial thrombophlebitis in the superficial venous system of lower extremities, and whether the dynamic phlebography is medically justified and safe method for early detection of clinically silent deep vein thrombosis in patients with superficial thrombophlebitis altered subcutaneous varicose veins in the lower extremities.

3. SAMPLE AND METHODOLOGY

Prospective study at the Clinic of Cardiovascular Diseases, University Clinical Center in Tuzla, with use of dynamic phlebography evaluated the incidence of clinically silent deep vein thrombosis in 92 patients with altered superficial varicose veins on the lower extremities. Patients were divided into two groups. In group A, 43 patients were classified with varices in the superficial veins of the lower extremities, without superficial thrombophlebitis altered varicose veins on the lower extremities without clinical signs of DVT in the lower extremities. In group B were classified 49 patients with varices in the superficial veins of the lower extremities. All patients in group B had thrombophlebitis superficial varicose veins changed on the lower extremities without clinical signs of DVT in the lower extremities. Patients in both groups were similar according to sex and age, with no statistical differences identified between the two groups. In the performance of dynamic phlebography on angiograph was selected cardio mode that is used to display the coronary arteries. With this we obtain live images with a visible flow of contrast media through the venous system. Before application of the contrast media through intravenous line, we set a supporter below and above the knee in order that contrast flow in the deep venous system. The amount of applied contrast was 50–100 ml, in a quantity to fill the venous system that is varicose changed. Supporter below knee is removed when 2/3 of the contrast media were applied, while supporter above the knee is removed when almost the entire amount of contrast media was applied. During removal of supporter we performed radioscopy and radiography as well as monitoring of the contrast media flow into pelvis veins. After that a representative selection of recordings is made that were stored on the X-ray film, and individual sequences of results are stored on a CD which can show the live image flow through superficial and deep venous system for subsequent analysis. We used iodine contrast agents during dynamic phlebography: Ultravist 300 and Ultravist 370.

In the statistical analysis we used methods from descriptive and comparative statistics. To test statistical significance of differences among the samples, depending on the quality and distribution of the results, we used chi-square (X²) test. Statistical hypotheses were tested at a level of α-0.05, so the difference between the samples are considered significant if p <0.05. The data were processed in the statistical program Statistica for Windows 5.0.

4. RESULTS

In group A 43 patients were evaluated with varices in the superficial veins of the lower extremities, without superficial thrombophlebitis altered varicose veins of the lower extremities without clinical signs of DVT in the lower extremities. This group is treated as a control, because outpatient and clinical monitoring of these patients is not established, nor is noticed the development of DVT in any of the patients in the period of follow up. Table 1 shows the localization of superficial veins thrombophlebitis on the lower extremities in patients with varices in the superficial veins of lower extremities and superficial thrombophlebitis altered varicose veins in the lower extremities without clinical signs of DVT in the lower extremities.

Localization of superficial thrombophlebitis in collateral veins (below knee) was observed in 25% of patients from a total of 12 patients which developed deep venous thrombosis, and collateral veins (above knee) was also recorded in 25% of patients. Superficial thrombophlebitis is affected vein saphena magna (below knee) in 33.33 cases, while at the same vein above the knee we did not record a single case of superficial thrombophlebitis. Superficial thrombophlebitis is affected vein saphena parva in 16.66% of total 12 patients. The above results show that the localization of superficial thrombophlebitis is most frequent at the vein saphena magna (below knee), and the least impact on the vein saphena magna above the knee in our sample.

Dynamic phlebography in patients with varices in the superficial veins of lower extremities and superficial thrombophlebitis altered varicose veins in the lower extremities without clinical signs of DVT in the lower extremities (group B), from a total of 49 patients we found the development of DVT in 12 patients (24.48%) in three men and nine women. Localization of deep vein thrombosis in the veins of the lower extremities is shown in Table 2. Localization of DVT was found in the iliaceofemoral region in 4.08% of the patients, whereas localization in femoropopliteal region was observed in 6.12% of patients, and localization in crural region was observed in 14.28% patients.

Localization of deep vein thrombosis at legs

<table>
<thead>
<tr>
<th>Localization of superficial thrombophlebitis</th>
<th>Number of patients</th>
<th>% from total number of patients</th>
<th>% from number of patients with DVT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collateral veins (below knee)</td>
<td>3</td>
<td>6.12</td>
<td>25</td>
</tr>
<tr>
<td>Collateral veins (above knee)</td>
<td>3</td>
<td>6.12</td>
<td>25</td>
</tr>
<tr>
<td>Vein saphena magna (below knee)</td>
<td>4</td>
<td>8.16</td>
<td>33.33</td>
</tr>
<tr>
<td>Vein saphena magna (above knee)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Vein saphena parva</td>
<td>2</td>
<td>4.08</td>
<td>16.66</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>24.48</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 1. Localization of superficial thrombophlebitis
Clinically Silent Deep Vein Thrombosis in Patients with Superficial Thrombophlebitis and Varicose Veins at Legs

**Table 2. Localization of DVT according to regions**

<table>
<thead>
<tr>
<th>DVT Localization</th>
<th>Number of patients</th>
<th>% from total number of patients</th>
<th>% from number of patients with DVT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iliofemoral region</td>
<td>2</td>
<td>4.08</td>
<td>16.66</td>
</tr>
<tr>
<td>Femoropopliteal region</td>
<td>3</td>
<td>6.12</td>
<td>25</td>
</tr>
<tr>
<td>Crural</td>
<td>7</td>
<td>14.28</td>
<td>58.33</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>24.48</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table 3. Localization of DVT on lower extremities veins**

<table>
<thead>
<tr>
<th>DVT Localization</th>
<th>Number of patients</th>
<th>% from total number of patients</th>
<th>% from number of patients with DVT</th>
</tr>
</thead>
<tbody>
<tr>
<td>V. iliaca</td>
<td>2</td>
<td>4.08</td>
<td>16.66</td>
</tr>
<tr>
<td>V. femoralis</td>
<td>3</td>
<td>6.12</td>
<td>25</td>
</tr>
<tr>
<td>V. poplitea</td>
<td>1</td>
<td>2.04</td>
<td>8.33</td>
</tr>
<tr>
<td>V. tibialis anterior</td>
<td>2</td>
<td>4.08</td>
<td>16.66</td>
</tr>
<tr>
<td>V. tibialis posterior</td>
<td>3</td>
<td>6.12</td>
<td>25</td>
</tr>
<tr>
<td>Crural vene</td>
<td>1</td>
<td>2.04</td>
<td>8.33</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>24.48</td>
<td>100</td>
</tr>
</tbody>
</table>

sis in the veins of the lower extremities was determined in iliac vein in 16.66% of cases, 25% femoral vein, 8.33% vein poplitei, 16.66% vein tibialis anterior, vein tibialis posterior 25% and crural veins in 8, 33% of patients with DVT (Table 3).

Outpatient monitoring of patients with superficial thrombophlebitis with diagnosed deep venous thrombosis in the period of one month after performing phlebography did not have the development of pulmonary embolism (PE). During patient follow-up these groups of patients did not have complications with use of anticoagulant therapy.

Statistical differences between groups A and B when it comes to the development of deep vein thrombosis were determined with chi-square test. Resulting chi-square test ($X^2 = 10.76$) at the level of significance of 95% and the degree of freedom 1, indicate significant statistical difference between these two groups. Such results confirm that in most patients with superficial thrombophlebitis and varicose veins have more chance to develop deep venous thrombosis.

### 5. DISCUSSION

This study was conducted with the aim of determining the incidence of deep venous thrombosis in patients with other symptoms and signs of superficial thrombophlebitis. In patients with varicose veins, this combination is rare, but in patients without varices and deep venous thrombosis is very common and phlebography in addition to other diagnostic methods is the method of choice in the diagnosis of DVT. It is believed that one quarter of patients with superficial thrombophlebitis should be subject of phlebography. CT and MRI are very expensive method for wider application, but can be very useful in cases where the diagnosis is not entirely certain, as it is in case of iliac vein thrombosis. However, in addition to phlebography methods as phlebography and color Doppler are essential for the diagnosis, evaluation of surgical treatment or defining the causes of chronic venous insufficiency.

In the group of subjects with superficial thrombophlebitis without signs of clinically silent deep vein thrombosis, we determined the localization of superficial thrombophlebitis in most cases at the vein saphena magna below knee (33.33%), while the localization on vein saphena magna above the knee is not recorded in any patient (2). We determine the superficial thrombophlebitis in 138 patients in the collateral veins of the proximal large saphena veins in 67 patients and saphenofemoral area in 58 patients. In other studies (15), incidence of localization of the superficial thrombophlebitis in vein saphena magna is 14.3%, while (16) indicate incidence of 43%. Occurrence of deep vein thrombosis and superficial thrombophlebitis varies from 7 to 25%. In most cases it is difficult to demonstrate the progression of superficial thrombophlebitis in deep vein thrombosis (17). Noted that saphenofemoral link represents the progression of superficial thrombophlebitis place in a deep vein thrombosis in four of six patients. In most cases, the greatest incidence of progression of deep venous thrombosis from untreated superficial thrombophlebitis is in proximal large saphena veins or saphenofemoral region, but also in femoral vein.

In our study, we notice an incidence of deep venous thrombosis in 24.48% patients, which corresponds to the results (1) where the incidence of DVT was 21.1% (2). Recorded the incidence of deep venous thrombosis caused by superficial thrombophlebitis in 19% of respondents. However, 2.5% of their patients had isolated superficial thrombophlebitis not associated with deep vein thrombosis. Other authors (18, 19, 20, 21) indicate DVT incidence resulting from superficial thrombophlebitis in 23%, 12%, 31% and 16% of patients. However, in these studies there are different variables, beginning with the indications for the study of methods to test (where they used phlebography, venography and ultrasound). Out of 24.48% patients in our study which had deep venous thrombosis, 18.36% are women aged 31 to 67 years, while men were aged between 26 and 52 years, or 6.12% of the cases. Research (22) show that the incidence of deep venous thrombosis in the general population is 5 patients per 1000 per year and that the incidence is similar between the genders, but it dramatically increases with age.

Two to three people per 1000 person annually, at age between 30 to 49, and 20 persons per 1000 annually, at age between 70 to 79 years are affected by DVT. The most common localization of deep venous thrombosis, we noted in crural region (14.28%), while iliac-femoral region was affected in 4.08% cases. Femoropopliteal region was affected in 6.12% cases (17). Found the presence of deep venous thrombosis in femoropopliteal region in 90% of patients, highlighting the increased risk of pulmonary embolism in these patients. As for the precise localization of deep venous thrombosis, we found that the localization of deep venous thrombosis in the veins of the lower extremities is present in the iliac vein in 16.66%, 25% femoral vein, 8.33% vein poplitei, anterior tibial vein 16, 66%, posterior tibial vein 25% and crural veins in 8.33% of
patients. Unlike (1) noted that pulmonary embolism that occurred as a result of deep vein thrombosis in 92 patients and pulmonary embolism which was recorded in the progression of superficial thromboembolitis into DVT in two patients, we recorded neither one case of PE.

All patients in our study, which have determined extension of superficial thromboembolitis into deep vein thrombosis, are treated in a conventional manner for acute deep vein thrombosis. Monitoring of these patients and pulmonary embolism which resulted from deep vein thrombosis in 92 patients. Unlike (1) noted that pulmonary embolism and deep venous thrombosis complicating superficial thromboembolitis. J Vasc Surg, 1998; 27(2): 338-43.


6. CONCLUSION

This study found that there is a statistically significant difference between the two investigated groups, which means that with thromboembolitis changed varicose subcutaneous veins of lower extremities frequently correspond to clinically silent deep vein thrombosis in the lower extremities. Such results confirm that in most patients with superficial varicose veins thromboembolitis there are big chances for development of deep veins thrombosis. Also, in any group there was no development of pulmonary embolism during or after the phlebography. On this basis we can claim that dynamic phlebography of deep and superficial veins of lower extremities in patients with thromboembolitis altered varicose subcutaneous veins of lower extremities is justified and safe method of early detection clinically silent deep vein thrombosis.

REFERENCES


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