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Case Report

Postoperative Deep Vein Thrombosis Complication In Orthognathic Surgery-Case Report

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Abstract

This paper aims to describe a case of deep vein thrombosis in a patient submitted to orthognathic surgery. It highlights the importance of investigating the risk factors associated with this unusual comorbidity with maxillofacial surgery, the onset of signs and symptoms, and the need for using preventive prophylactic measures. A 22 years old man, weighing 118 kg, height 1.76m, with a body mass index (BMI) of 38.09, presented twenty days after his orthognathic surgery with episodes of syncope, sweating, chills and loss of sphincter control. The patient was hospitalized and initially was intravenously administered 0.9% saline solution with oxygen on mask. Venous Doppler (VD) and echocardiography (Echo) were performed and pulmonary thromboembolism was diagnosed. The patient remained hospitalized for ten days being prescribed anticoagulant drugs for thrombolysis and analgesics for pain control. After remission of symptoms, the tests were redone and no sequels were addressed.

Keywords: *Thrombosis; Orthognathic surgery; postoperative complications*

Introduction

Deep Vein Thrombosis (DVT) develops from thrombus formation when they cause partial or complete obstruction of the deep venous circulation. Three main components are related to thrombogenesis process - venous stasis, endothelial damage and hypercoagulability this triad was described by Virchow in 1846 and the fibrinolytic state of the patient added as a fourth component, almost 10 years later [1].

Venous thromboembolism is within comorbidities group classified as unusual Trans or postoperative complications in the maxillofacial surgery. DVT is a type of thromboembolism that may occur during surgery as an eminent difficulty especially in patients with high risk, resulting in unintended consequences [1,2].

Major surgeries can lead to the development of DVT which a serious entity with significant morbidity and is related to various etiological factors. Several risk factors predisposing to DVT are listed such as: prolonged immobilization, use of oral contraceptives, pregnancy, smoking, overweight [3], cancer [4], patient age, hereditary thrombophilia, previous venous thromboembolism, hormone replacement and surgical procedures [5].

DVT after orthognathic surgery is believed to be uncommon[1] but there are few published articles quantifying the incidence after oral and maxillofacial operations. The overall incidence of symptomatic DVT after orthognathic surgery falls into the low risk category according to the Second Thromboembolic Risk Factors Consensus Group (THRiFT II) classification [6].

In orthognathic surgeries DVT was estimated by Lowry [1] as 0.00035%, and by Van de Perre [7] as 0.14% with one case of pulmonary embolism. Moreano., *et al*. [8] identified 0.26% in his series of 12.805 cases. Even though careful evaluation of the risk factors that predispose to DVT is mandatory in order to adopt thromboprophylaxis needed according to the degree of risk one might present [2]. A simple and modified table below (Table 1) presents the low, moderate and major risks for DVT based on the most recent consensus published in 2005.

Low Risk	Moderate Risk	Major Risk
Surgeries in patients under 40 years of age without other risk factors;	Major surgery (general, urological or gynecological) in patients ranging from 40-60 years of age without additional risk factors;	General surgery in patients over 60 years of age;
Minor surgeries (less than 30 minutes and without extended rest) in patients over 40 years with no other risk not age;	Surgery in patients less than 40 years taking estrogens.	General surgery in patients ranging from 40-60 years of age with additional risk factors;
Minor trauma		Major surgery in patients with a history of DVT or PE past or thrombophilia;
		Major amputations;
		Major orthopedic surgery;
		Major surgery in patients with malignancies;
		Major surgeries in patients with other hypercoagulable states;
		Multiple traumas with fractures of the pelvis, hip or lower extremities.

Table 1: *Degrees of predisposing risks for DVT based on Moura[9].*

As far as the local of occurrence DVT is more prevalent in lower limbs but it can also occur in upper limbs and vena cava, the latter being less common but on rise due to the use of central venous access catheters with chances of affecting internal jugular veins and cavernous sinus [10-12].

DVT has diffuse signs and symptoms, less specific which often makes difficult a clinical diagnosis being characterized according to the affected veins and thrombus size. The most frequent clinical picture are swelling and pain but also other conditions such as muscle rigidity, cyanosis and dilation of the superficial veins more commonly developed in the calf may be encountered [12].

For the diagnosis of DVT clinical examination associated with imaging studies have proved effective. With the diagnosis established it is possible to institute an immediate treatment with greater chances of recovery preventing the development of sequels [10,13].

The prophylactic treatment of DVT involves physical methods and/or the use of drugs like heparin and oral anticoagulants, in order to prevent or at least reduce the chance of a patient developing this disease. The most commonly used heparins are nadroparin, dalteparin and enoxaparin having indicated their early use of two to four hours prior to surgery. Among the used anticoagulants list Warfarin, Dextran and acetylsalicylic acid [12].

This study aims to report the occurrence of a case of DVT after orthognathic surgery, emphasizing the importance of investigating the risk factors contributing to its occurrence and the need to recognize signs and symptoms associated with this disease and to take the correct preventive measures.

Case Report

A 22 years old man, mouth breather, candidate for orthognathic surgery, during his anamnesis reported rhinitis. Physical examination showed blood pressure (BP) 122 x 76 mmHg, heart rate (HR) 59 bpm, respiratory rate (RR) 14 rpm, weighing 118 kg, height 1.76 m, with body mass index (BMI) of 38.09 and an ASA I patient. Patient underwent orthognathic surgery with a maxillary advancement through the osteotomy technique Le Fort I, associated to bilateral turbinectomies which was performed on March 24th, 2012. Surgery was uneventful, took two hours and after the patient remained in bed for a period of approximately 12 hours with an unnoteworthy postoperative. The patient discharged the hospital next day and he was sent home for regular office follow-ups.

On the twentieth day after orthognathic surgery, the patient reported episodes of syncope anticipated by sweating, chills and loss of sphincter control. The patient was taken home and slept for the rest of the day reporting some chest discomfort. In the morning of next day the patient was breathing with difficulty and had two more syncope episodes. He sought help in the hospital where he was operated and upon arrival at the hospital he experienced syncope again with sphincter release. He was admitted with malaise, dizziness, intense sweating, cyanotic extremities, saturation of 89%, BP 120 x 60 mmHg, HR 99 bpm, RR 31 rpm, temperature 36°C and depressed level of consciousness and presence of mild edema in the lower limbs. The initial approach was the administration of saline solution 0.9% (500 ml) and oxygen on mask. Venous Doppler and echo tests were performed. The echo showed dysfunction and significant dilation of the right ventricle, moderate pulmonary hypertension, mild tricuspid regurgitation, while VD showed DVT in the left popliteal vein (Figure 1A-B), and then signs of pulmonary thromboembolism (PTE).

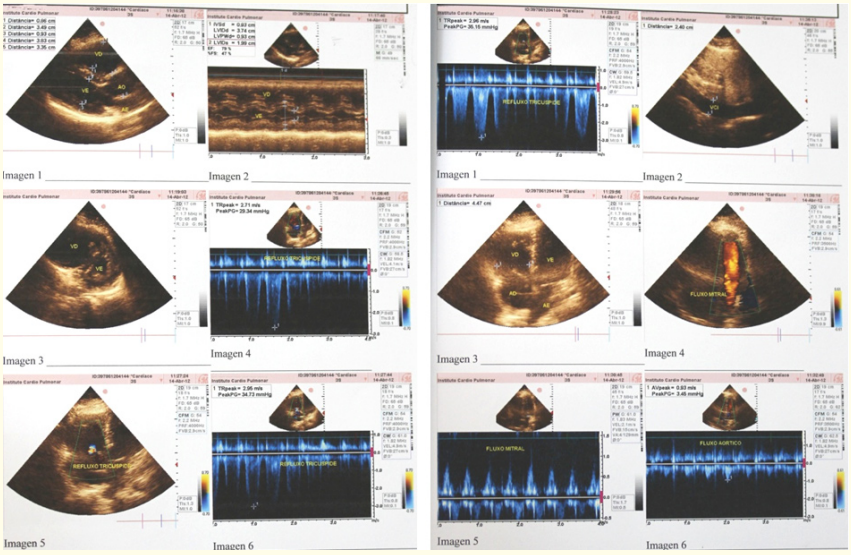

Figure 1A-B: *Doppler results showed double popliteal vein on the left lower limb. One of them not collapsible and without flux on Doppler. The other one was found pervious.*

The patient was then sent to the ICU and treated with nor adrenaline to increase BP for about thirty minutes with the stabilization of the BP. After normalization the medication was discontinued and the patient was maintained resting with bed elevation of thirty degrees, bland diet, with cardiac and BP monitoring. He remained hospitalized for ten days being prescribed with Alteplase (Actilyse) for immediate use (100 mL for two hours) for thrombolysis. During the time he remained in bed he received the anticoagulants Enoxaparin Sodium (Clexane) and Warfarin Sodium (Marevan), analgesics (dipyrone and Tramadol) for pleuritis due to lung tissue necrosis, and assisting on the treatment of DVT physical therapy was initiated. It was also prescribed Clonazepam (Rivotril) for two days because patient reported difficult sleeping due to pleuritis.

On hospital discharge the patient received Warfarin Sodium (Marevan) and was verbally oriented to limit eating green vegies and to avoid physical activities.

After the whole process control done other exams such as VD, echo, ECG under physical strength and no pulmonary or cardiac sequel were detected. Anticoagulation was suspended and Enoxaparin Sodium (Clexane) prescribed only for long trips or in cases of future hospitalization.

The patient presented in this case report delayed to seek help and probably only sought the hospital on the twentieth day after his orthognathic surgery due to the episodes of syncope, sweating, chills and loss of sphincter control he experienced which were indicative signs of a progressing DVT.

Discussion

Deep Vein Thrombosis (DVT) is the formation of a blood clot in one of the deep veins of the body which usually occurs in those deep veins within the leg, particularly within the calf muscles quite rare. The veins in the arm, eye or brain may be affected but is rare.

It is very important do mention that DVT often occurs in structurally normal vessels developing due to stasis of blood or hypercoagulable states [14]. Previous history of venous thromboembolic disease is a key risk factor for DVT but other important risk factors are as such: 1) increasing age, 2) family history, 3) drugs like synthetic estrogens in the oral contraceptive pills, 4) tamoxifen or hormone replacement therapy, 5) pregnancy and the puerperium, 6) recent surgery or trauma, 7) clotting disorders, 8) malignancy, 9) obesity, 10) smoking, 11) varicose veins, and 12) periods of immobility [15,16].

DVT signs and symptoms are vague which generates a diagnostic difficulty [11,17]. It is difficult to diagnose this condition because DVT symptoms are shared by many other conditions and specific tests are needed to rule out other problems or to confirm the diagnosis. These tests to diagnose DVT may include: D-dimer test, Duplex Ultrasound (DU), Venography and Magnetic Resonance Imaging (MRI).

D-dimer test is a very specific blood test that detects pieces of blood clot that have broken down and are loose in the blood stream [18]. DU requires no radiation and produces high-frequency sound waves which bounce off the inside of patient´s body, producing images of blood vessels. During the exam the wand sends sound waves into the body and then sends the echoing waves to a computer, which produces images of vessels and the blood clots, as well [19]. Venography test involves taking a special X-ray that allows the anatomy of the veins to be seen. During the test a radioactive dye is injected into a vein on the top of the foot which highlights the veins on the X-ray. Although accurate this test carries a slight risk of increasing the chances of additional blood clots [20]. MRI test uses radio frequency waves and a strong magnetic field to create detailed images of the inside of patient´s body making possible to evaluate the vascular system [21].

DVT is an unusual complication in elective surgery of the maxillofacial region. Studies [16,22] showed that the incidence of venous thrombosis is uncommon in orthognathic surgery especially in patients without prevalent risk factors for this etiology and pathogenesis, occurring in approximately 0.00035% of patients who underwent surgery [1].

However DVT is a complication that can lead to a serious risk to the individual and presents significant morbidity with the possibility of death [23]. For this reason, it is very important an early and correct diagnosis of the DVT signs and symptoms, having always present in mind the risk classification which predisposes to DVT knowing that the chance of developing it increases when the procedures are complex and long lasting, especially in patient submitted to major surgery [2].

The literature is consensual to sustain that immobility, obesity, age, pregnancy, smoking, use of contraceptives, major surgery lasting more than thirty minutes, among other conditions are risk factors that may be associated with the occurrence of DVT [3,5,9]. According the risk factors mentioned in the literature, the probable cause of the event above described was related to obesity.

Prophylactic measures with regard to surgery should be carefully evaluated, since the procedure itself is already a risk factor [12,17]. In this regard it is important to pinpoint that the literature supports the use of prophylactic measures for DVT through mechanical methods which may include early ambulation, the intermittent pneumatic compression and the use of elastic compression (elastic stockings) which is a safe, inexpensive and effective method [12,24]. Drug therapy in its turn is the most used method and covers the use of anticoagulants for prophylaxis for surgery. Although DVT worldwide incidence is low in the maxillofacial surgery, the use of prophylactic drugs is justified for patients with clear potential risk factors [2,22].

The leading surgeon judged the risk-benefit of DVT prophylactic measures for this patient's surgery and based on low complication incidence rates in orthognathic surgery he decided to not use any drug therapy.

In systemic anticoagulation, which proves to be the most effective, the most commonly used drugs are standard Heparin in low-dose and Heparin of low molecular weight (LMWH) such as Enoxaparin, Dalteparin and Nadroparin. Also anticoagulants usage includes drugs such as Warfarin, Dextran and acetylsalicylic acid [12,24].

Studies [10,11] reinforce the difficulty of DVT diagnosis, indicating Duplex Ultrasound, election feature, for not being invasive and with high sensitivity, in addition to venography and magnetic resonance venography (VRM) as auxiliary resources [11,13]. For this reason it is imperative that the surgeon and his team to track and value all patient´s complaints and postoperative complications to assess the need for medical evaluation, enabling rapid diagnosis, seeking thereby minimize the consequences of DVT.

Although pharmacological measures have been generally the preferred treatment for DVT, mechanical means of limiting venous stasis can also serve to reduce its incidence. Mechanical treatments are designed to limit stasis and increase fibrinolytic activity in the paralyzed lower extremities. Rotating treatment tables would prevent the development and progression of DVT. Pneumatic compression devices are not suitable for patients with severe arterial insufficiency while sequential pneumatic compression devices or gradient elastic stockings can be associated and are good methods for reducing the risk of DVT [25].

The application of graduated compression stockings reduced the incidence of DVT after major general surgery from 24.5 to 9.3% [26].

Graduated compression stockings, but not intermittent pneumatic compression stockings, may prevent venous distension during operation and so reduce vascular endothelial damage once veins in the upper limb become distended during operations which may cause vascular endothelial injury and contribute towards DVT [27,28].

Coleridge-Smith., *et al*. showed that in the absence of stockings calf veins become distended during operations under general anaesthesia, and that this is exacerbated by infusion of an excess of one liter of crystalloid [29].

Intermittent pneumatic compression during and after operations may reduce the incidence of DVT after major general surgery from 25.1 to 9.9%, but their continued use postoperatively is inconvenient and may discourage early mobilization [30].

Conclusion

From the present case report we observed that to prevent DVT occurrence it is imperative that all risk factors the patient presents must be assessed and the risk-benefit of prophylactic measures, especially the pharmacological one, are to be rigorously judged by the surgeon.

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