

# Deep vein thrombosis: A rare complication in oral and maxillofacial surgery: A review of two cases

M. R. RAMESH BABU, C. RAMESH<sup>1</sup>, K. THIRUMURUGAN, G. ARUN PRASAD

## Abstract

Deep vein thrombosis (DVT) is caused by obstruction of blood flow of deep veins in upper and lower limb. One of the precipitating factors for DVT is surgery under general anesthesia exceeding 30 min. However, there are very few reports of DVT associated with surgery of oral and maxillofacial region. In this paper we report two cases of DVT involving left ilio-femoropopliteal deep vein in one patient treated for fractured left angle of mandible and left peroneal vein in the other patient treated for oral sub mucous fibrosis. Clinical and color Doppler examination were performed to diagnose the condition and were referred to vascular surgical unit of higher institute for further management. These cases illustrates any surgery of maxillofacial region is not free from risk of DVT, which can cause fatal pulmonary thromboembolism.

**Keywords:** Deep vein thrombosis, fracture mandible, oral and maxillofacial surgery, oral submucous fibrosis, pulmonary embolism, venous thromboembolism

## Introduction

Deep vein thrombosis (DVT) is formation of blood clot (thrombus) within the deep veins of any parts of the body. It is a form of thrombophlebitis. DVT most commonly affects the veins of lower limb/deep veins of pelvis. Clinical features include localized swelling, redness, and calf muscle tenderness. Major complications of venous thrombosis are a disabling post-thrombotic syndrome and acute death from a pulmonary embolism (PE) that occur in 20% and 1-2% of patients, respectively.<sup>[1]</sup> The development of DVT is a common event in long-term hospitalized patients and its diagnosis is not infrequently missed. Venous thrombi are initiated by changes in the coagulation mechanism of the blood, damage to the

endothelium lining of blood flow and hypercoagulability. To this Virchow's triad, the fibrinolytic state of the patient should now be added as a fourth component.<sup>[2]</sup> DVT occurs in 25% of all long term hospitalized patients. It occurs in more than 50% of patients undergoing orthopedic surgical procedures (hip/knee replacement) and in 10-40% of patients who undergo abdominal or thoracic surgery.

## Case Reports

### Case 1

A 40-year-old woman presented with complaint of pain and swelling in left lower jaw and inability to open the mouth fully for about 6 days. History of trauma (self fall) 6 days ago and there was no history of loss of consciousness with no clinical and radiological evidence of brain injury. There was a history of childhood poliomyelitis. General examination revealed left lower limb paresis. Extra oral examination reveals tenderness in left condylar region, angle of mandible and along the lower border of mandible. Mouth opening was restricted. Intra-orally, occlusion was deranged. Sublingual ecchymosis was present. Left lower teeth were tender on percussion. Left mandibular third molar was fractured. Orthopantomogram revealed left angle and left parasymphysis fracture of mandible [Figure 1]. After thorough clinical and radiographical evaluation patient was diagnosed as suffering from fractured left angle and left parasymphysis of mandible. Routine blood investigations were done and patient was posted for open reduction and internal fixation (ORIF) under general anesthesia (GA). ORIF was done under GA by submandibular approach [Figure 2] using two, 2 mm 4 hole with gap stainless steel plate and 7 nos. 2 × 8 titanium screws. Duration of surgery was about 45 min. On second post-operative day patient developed mild swelling in right leg which on examination was not tender but of pitting type [Figure 3]. On the 5<sup>th</sup> day after surgery,

*Departments of Oral and Maxillofacial Surgery, Mahatma Gandhi Post Graduate Institute of Dental Sciences, <sup>1</sup>Indira Gandhi Institute of Dental Sciences, Mahatma Gandhi Medical College and Research Institute Campus, Pillaiyarkuppam, Pondicherry, India*

**Correspondence:** Dr. C. Ramesh, Department of Oral and Maxillofacial Surgery, Indira Gandhi Institute of Dental Sciences, Mahatma Gandhi Medical College and Research Institute Campus, Pillaiyarkuppam, Pondicherry - 607 402, India.  
E-mail: ramesh\_candy@rediffmail.com

Access this article online	
Quick Response Code: 	Website: <a href="http://www.contempclindent.org">www.contempclindent.org</a>
	DOI: 10.4103/0976-237X.114868

swelling became painful and reaches above the knee and calf muscle tenderness was elicited.

Color duplex Doppler examination of both lower limbs-venous study was performed. Report revealed normal Doppler evaluation of veins of left lower limb and ilio-femoropopliteal deep venous thrombosis in right limb. Patient was referred to vascular surgery unit of higher institute for further management. Now patient is on oral anticoagulant.

### Case 2

A 44-year-old man reported to our department with a complaint of restricted mouth opening and burning sensation inside the mouth for 6-month duration with history of areca nut chewing for 4 years. Patient was diagnosed as suffering from oral submucous fibrosis (Grade IV) and treated with release of fibrous bands [Figure 4] and collagen grafting under GA. Operative time was 105 min. On the fourth post-operative day patient complained of calf muscle pain in the left limb and on examination severe localized calf muscle tenderness was elicited. Color Doppler reveals thrombosis in peroneal vein in left limb and popliteal and femoral veins are free of thrombus. Patient was referred to higher institute and anticoagulant therapy was started.

### Discussion

DVT and its potential complication PE is a major cause of morbidity and mortality in hospitalized patients (25%). The risk factors for venous thrombosis differ from those for arterial disease like myocardial infarction, stroke, and atherogenic factors such as smoking, hypertension, or hyperlipidemia do not increase the risk of venous thrombosis.<sup>[3]</sup> Any major surgery lasting longer than 30 min under GA is significant risk factor for DVT (orthopedic/thoracic/abdominal).

Acquired risk factors for DVT include immobility, surgery, trauma, neurological disease with paresis, malignancy, central venous catheterization and transvenous pacemaker placement, varicose veins, increasing age, obesity, pregnancy and post partum period, previous DVT, hormone therapy<sup>[1,3]</sup> while deficiencies in blood tissue factors such as anti-thrombin III, protein C, protein S and plasminogen activators lead to spontaneous intravascular coagulation and presence of lupus anticoagulant and anti-thrombin antibody predispose to clinical thrombophilia.<sup>[2]</sup> There is a low incidence of venous thromboembolism (VTE) in Asian and Hispanic Populations (compared with white and African American populations) due to genetic factors predisposing to VTE, such as factor V Leiden, which occurs in 0.5% of the Asian population versus 5% of the white population.<sup>[4]</sup> The prevalence of asymptomatic DVT in a hospital is high in elderly patients especially those over, age 80 and very low in patients under age 55. The incidence rate increases exponentially with age. In the absence of prophylaxis, the incidence of hospital – acquired DVT is approximately 10-40%.<sup>[4]</sup> Many procedures in oral and

maxillofacial surgery of a relatively minor nature are performed in young adults who rapidly mobilize post-operatively and therefore, have few risk factors for the development of DVT and PE. Advances in maxillofacial surgery; however, have led to longer operations on older patients who are less resilient and mobilize more slowly. This is the major risk factor in the etiology and pathogenesis of DVT.

Incidence of DVT and PE in major oral and maxillofacial surgery is low, in the range of 0.00035-0.06% at worst. In oral and maxillofacial surgery, 58.3% of pulmonary emboli occur in patients operated on for malignant disease whilst 25% followed trauma. Incidence of DVT after trauma is nearly four times the incidence of patients undergoing orthognathic surgery. Incidence of DVT in one case followed third molar excision was reported in literature.<sup>[2]</sup>

### Risk factor stratification for DVT

American College of Chest Physician (ACCP) stratified surgical patients according to DVT risk.<sup>[4-6]</sup>

Low-risk: Age <40 years + minor surgery + no risk factors.  
Moderate risk: Age 40-60 years + minor surgery + no risk factors/age >40 years + major surgery + any risk factor present/trauma without additional risk factors.

High risk: Age >60 years + minor surgery/age >40 years + major surgery + risk factor present/trauma with additional risk factors.

Highest risk: Age >40 years + major surgery + multiple risk factors like previous DVT/cancer/hypercoagulable condition/major trauma/hip surgery/spinal cord injury.

### Prophylaxis methods

Mechanical methods: Graduated compression stocking (GCS), intermittent pneumatic compression (IPC), venous foot pumps.

Pharmacological methods: Antiplatelet agents (aspirin, dextran), antithrombotic agents (low-dose unfractionated heparin (LDUFH)/low molecular weight heparin [LMWH]), vitamin K antagonist (warfarin), synthetic pentasaccharide factor Xa inhibitor (fondaparinux).<sup>[6]</sup>

### ACCP guidelines for DVT prophylaxis

Low-risk: No specific prophylaxis, early and aggressive mobilization

Moderate risk: LDUFH every 12 h/LMWH < 3400U/day

High-risk: LDUFH every 8 h/LMWH > 3400U/day or IPC

Highest risk: LMWH < 3400U/day, fondaparinux, warfarin (INR 2-3) or IPC/GCS + LDUFH/LMWH.<sup>[4,5]</sup>

In our patients, first patient had a risk of thromboembolic event (i.e., right limb paresis) and the second patient was totally free of risk factors and fall under the category of low risk for DVT prophylaxis but in review of literature, fibrin degradation products and hyperfibrinogenemia or cryofibrinogenemia were associated with oral submucous fibrosis, which may be



**Figure 1:** Panoramic view of fractured left angle of the mandible



**Figure 2:** Healed submandibular incision for open reduction and internal fixation



**Figure 3:** Edematous right leg due to deep vein thrombosis of right iliofemoropopliteal deep vein



**Figure 4:** Surgical release of fibrotic bands in submucous fibrosis

the reason for DVT in oral and submucous fibrosis patients. Since both the patient undergone minimally invasive surgery (category II) and was ambulatory from the day of surgery and literature reveals very low incidence of DVT in maxillofacial surgery. DVT is a preventable cause of in-hospital morbidity and mortality. Oral and maxillofacial surgery is not free of risk of DVT, which can cause fatal acute pulmonary thromboembolism. Therefore we have to assess the patient for risk of thromboembolism and proper prophylaxis has to be done to prevent DVT in individual with risk.

## References

1. Rosendaal FR. Venous thrombosis: A multicausal disease. *Lancet* 1999;353:1167-73.
2. Lowry JC. Thromboembolic disease and thromboprophylaxis in oral and maxillofacial surgery: Experience and practice. *Br J Oral Maxillofac Surg* 1995;33:101-6.
3. Heit JA, Silverstein MD, Mohr DN, Petterson TM, O'Fallon WM,

Melton LJ 3<sup>rd</sup>. Risk factors for deep vein thrombosis and pulmonary embolism: A population-based case-control study. *Arch Intern Med* 2000;160:809-15.

4. Sorathia D, Naik-Tolani S, Gulrajani RS. Prevention of venous thromboembolism. *Oral Maxillofac Surg Clin North Am* 2006;18:95-105.
5. Caprini JA. The future of medical therapy for venous thromboemboli. *Am J Med* 2008;121:S10-9.
6. Geerts WH, Pineo GF, Heit JA, Bergqvist D, Lassen MR, Colwell CW, *et al.* Prevention of venous thromboembolism: The Seventh ACCP Conference on Antithrombotic and Thrombolytic Therapy. *Chest* 2004;126:338S-400.

**How to cite this article:** Babu MR, Ramesh C, Thirumurugan K, Prasad GA. Deep vein thrombosis: A rare complication in oral and maxillofacial surgery: A review of two cases. *Contemp Clin Dent* 2013;4:236-8.

**Source of Support:** Nil. **Conflict of Interest:** None declared.