ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 17, Issue, 04, pp.32670-32672, April, 2025
DOI: https://doi.org/10.24941/ijcr.48825.04.2025

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

THROMBOANGIITIS OBLITERANS: A CRITICAL REVIEW

[1]Dr. Nisha Bharti and [2]Dr. Ajay kumar Gupta

[1]PG scholar, P.G. department of Shalya Tantra, Uttarakhand Ayurveda University, Rishikul Campus, Haridwar, Uttarakhand Indian Pin code- 249401; [2]H.O.D. and Professor, P.G. department of Shalya Tantra, Uttarakhand Ayurveda University, Rishikul Campus, Haridwar, Uttarakhand Indian Pin code- 249401

ARTICLE INFO

Article History:
Received 20th January, 2025
Received in revised form
19th February, 2025
Accepted 26th March, 2025
Published online 30th April, 2025

Key words:

Buerger's Disease,
Tobacco, Ischaemia, Gangrene.

**Corresponding author:*
Dr. Nisha Bharti

ABSTRACT

Thromboangiitis obliterans, also known as Buerger's disease. It is a rare non- atherosclerotic inflammatory disorder that predominantly develops in young to middle-aged smokers and tobacco users. It causes inflammation and clotting in small and medium-sized blood vessels (plantar, tibial, radial, etc.), mainly in the upper and lower extremities.

Citation: Dr. Nisha Bharti and Dr. Ajay kumar Gupta. 2025. *"*Thromboangiitis obliterans: A critical review*". International Journal of Current Research, 17, (04), 32670-32672.*

INTRODUCTION

It was initially described by Felix von Winiwarter in 1879, later it was published by Leo Buerger in 1908 and again in 1924. He practiced at the Lenox Hill Hospital (1901–1904), then the Mount Sinai Hospital (1904–1905), after as a volunteer in the surgical clinic at Breslau. Leo Buerger worked as a pathologist and surgeon at Mount Sinai Hospital. There in 1908, he gave the first accurate pathological description of thromboangiitis obliterans or Buerger's disease. The disease is more common in men between 20 and 40 years of age. It is the inflammatory reaction in the arterial wall involving veins and nerves in which both upper and lower extremities are involved. It spreads from the tibial arteries to the vessels of the foot in the lower extremities and spreads beyond the popliteal arteries. It begins with arterial involvement in the upper extremities, commonly distal to the forearm. Over time, it can lead to reduced blood flow, tissue damage, and even gangrene, often requiring amputation in severe cases.

Aetiology [3][4]

- A specific cause of this disease is not known till date.
- This disease is strongly linked with tobacco use and cigarette smoking. It usually takes 20 or more cigarettes per day for this condition to develop.
- Atherosclerosis that is build up of fats, cholesterol and other substances in and on the artery walls. This build up is called plaque, which causes hardening of the arteries. Arteries may narrow due to plaque deposition and causes obstruction to the blood flow. The plaque may dislodge, resulting in a blood clot, which also plays a major role in developing Buerger's disease.
- Genetic and immune system factors plays a major role. Autoimmune diseases occurs when the body's immune system attacks and destroys healthy body tissue by mistake**.** Antibodies and lymphocyte-mediated sensitivity to collagen occur in this illness, which causes inflammation (vasculitis) in small and medium arteries and veins.
- Patients with Buerger's disease usually come from lower socio-economic groups and they often have poor hygiene. Poor hygiene can lead to infections, ulcers, and even gangrene. Infections in regions with inadequate blood flow may not recover at all or may heal more slowly.
- In some reports, familial predisposition has been noted. But black populations are rarely affected due to lack of some genetic factors associated with the disease.

Pathogenesis [4][5]: Tobacco smoking is the most popular form, being practiced nowadays. The act of smoking involves burning material and then inhaling the smoke. The active ingredients in the dried, burned plant leaves evaporate and can enter the respiratory system through air, which is then absorbed into the bloodstream of a person.

These active substances are a mixture of aerosol particles that include the pharmacologically active alkaloid nicotine, which stimulates the nicotinic acetylcholine receptors in the brain. Other active substances inhaled by smoking include cocaine, tetrahydrocannabinol, and morphine. Smoke contains active substances like carbon monoxide and nicotinic acid which cause initial vasospasm and hyperplasia of intima, due to which narrowing or tightening of the artery occurs. This reduces blood flow through the artery, sending less oxygen than normal to nearby tissues which promotes clot formation.

Thrombosis as well as obliteration of vessels occur commonly in medium- sized vessels. Systemic necrotizing inflammation of blood vessels known as Polyarteritis nodosa (PAN) commonly occurs, the involvement is segmental. Due to the Nerve involvement, it causes rest pain. After that, the features of ischaemia appear in limbs as well as obstruction occurs. Once the obstruction occurs, multiple collaterals become open up.

Through these collaterals, blood supply is maintained to the ischaemic area. It is called as compensatory peripheral vascular disease. If a patient continues smoking, the disease spreads to the collaterals, obstructing them and resulting in severe ischaemia, also known as decompensatory peripheral vascular disease. Presently it is called as critical limb ischaemia which causes rest pain, ulceration, and gangrene.

- The acute lesions and chronic lesions in Buerger's disease are segmental. Dense polymorphonuclear leukocyte aggregation, microabscesses, and multinucleated giant cells occurs in acute lesions.
- The chronic lesions show a decrease in hypercellularity, organized thrombus and blood vessel fibrosis. Artery, veins and the nerve are involved. The involvement of the nerve is responsible for extreme pain.

Clinical Features [6][7]

The signs and symptoms of Buerger's disease are

- Skin changes on the fingers or toes appear. Blue, red, and pale tinge to fingers or toes occurs.
- Presence of burning or tingling sensation in hands or feet.
- Hands or feet become cold.
- The limbs become rubor (red) on dependence and pallor on elevation as well as small, painful sores develop on the fingers or toes.
- Intermittent claudication in foot and calf having rest pain, ulceration and gangrene.
- As the illness worsens, the claudication distance gets shorter and the leg's perfusion can become so poor that anaerobic respiration happens even when the body is at rest. This usually affects the foot and calf & discomfort occurs when the foot is elevated or lying down.

According to the Boyd's classification, grades of intermittent claudication are

- **GRADE I:** After walking for sometime patient has pain, however the pain disappears when the patient continues to walk. The pain-producing substances are washed off by the adequate collateral supply.
- **GRADE II:** Patient has pain after walking, but he can continue to walk inspite of slight pain
- **GRADE III:** Patient has pain after walking for some time with continued walking the pain aggravates and the patient has to take rest to get relief from pain.

- Pain is typical of intermittent claudication i.e. pain is increased when the muscle is exercised and disappears when the exercise stops.
- Because of the involvement of peripheral, the pedal arteries are impacted early, and patients experience foot claudication, or pain while walking at the arch of the foot.
- Patient's rest pain becomes so severe that they are unable to fall asleep.
- Recurrent migratory superficial thrombophlebitis, also known as thrombophlebitis migrans or Trousseau's syndrome, is a condition that involves repeated blood clots in the veins of the limbs and trunk.
- Postural color changes, trophic alterations, ulceration and gangrene of one or more digits appears.

Physical examination [8]

Inspection: Pallor, Rubor, Edema, Cyanosis, Dark discoloration, Ulceration, Gangrene, and Pedal pulses may or may not be intact bilaterally and are typically notable during physical examination in patients with Buerger's disease. Examination is done for any deformity of both upper limbs and lower limbs, any muscles wasting in thigh, calf or foot. These include loss of hair from the digits, atrophy of the skin and brittle nails. There may not be any specific finding till gangrene develops. The peculiar feature is that the ischaemic area is usually sharply demarcated with relatively good circulation in adjacent tissues.

Palpation

Pulse- Rate, rythtm, character of pulse is palpated. Femoral pulse, popliteal pulse, dorsalis pedalis pulse, posterior tibial pulse in the lower limb can be palpated. The most frequent finding is absence of posterior tibial and dorsalis pedis pulses in the feet. In the upper extremity the radial pulse may be absent. Tender nodules along the veins may be felt and may indicate phlebitis. Skin temperature is noted. For this, palpation is started from foot and noted that at what level temperature becomes normal, in comparison to the normal side.

Investigations [9]

- Blood Examination:- Haemoglobin, Clotting time, Bleeding time, and Erythrocyte sedimentation rate
- Arterial Doppler
- Duplex scan
- Arteriography
- Transfemoral retrograde angiogram
- Transbrachial angiogram
- Ultrasound abdomen
- Vein, Artery, Nerve biopsy

Treatment [10] [11] [12]

Conservative treatment

- Stop smoking- smoking is considered to be the most important risk factor of Thromboangitis obliterans. Patient must stop smoking totally, both active as well as passive smoking.
- Limb elevation - elevation of limb along with other gentle exercises are recommended to improve circulation.
- Warm fomentation is advised.
- Proper foot care and the use of appropriate footwear are advised.
- Drugs- Symptomatic management may include the use of calcium channel blockers, anticoagulants, anti inflammatory drugs or vasodilators. For intermittent claudication, the implementation of platelet inhibitors and vasodilators can be beneficial.

Surgical treatment

- Amputation- is done at different levels depending on site, severity and extent of vessel occlusion.
- Lumbar sympathectomy- relieves chronic lower limb ischaemia.
- Profundaplasty-is performed to open more collaterals across the knee joint by blocking the profunda femoris artery.

Diffrential diagnosis [13]

- Atherosclerosis
- Raynaud syndrome
- Diabetic foot ulcer
- Frostbite
- Polyarteritis nodosa

Prognosis [14]: The risk of amputation is about 20% within 10 years after onset of symptoms. Although it varies with the use of tobacco. In some patients, completely quitting smoking significantly slows the progression of the disease.

CONCLUSION

Buerger's Disease is a medical condition of unknown etiology, closely linked to tobacco abuse. It is a condition that is likely to result from chewing tobacco or smoking, which causes inflammation in the lining of the small and medium arteries, resulting in restriction of blood flow. Reduced oxygenated blood flow can lead to symptoms in the arms and legs, including coldness, pain, tingling, and changes in color. In severe cases, this condition may result in infection and gangrene. The main treatment is to completely eliminate all forms of tobacco and nicotine intake. When medications and sympathectomy fail to relieve ischemic pain, then in severe cases surgical procedures viz. amputation, revascularization, neuromodulation techniques via stimulation, etc can be advocated.

REFERENCES

1. Somen Das (2018) Manual on clinical Surgery(10th Edition) page no. 219.
2. Somen Das (2018) Manual on clinical Surgery(10th Edition) page no. 219.
3. F. Charles Brunicardi on Schwartz's principal of Surgery (8 th Edition) page no.793
4. Somen Das (2018) Manual on clinical Surgery(10th Edition) page no. 220.
5. SRB's Manual of Surgery-Sriram Bhat M (3th Edition) page no. 152.
6. https://www.who.int/en/news-room/fact-sheets/detail/tobacco
7. https://www.medicalnewstoday.com/articles/buergers-disease#symptoms
8. Somen Das (2018) Manual on clinical Surgery(10th Edition) page no. 221.
9. SRB's Manual of Surgery-Sriram Bhat M (3th Edition) page no.154.
10. Göçen U., Atalay A., Deniz L. Succesfull multidisciplinary treatment in a case of Buerger. J. Cardiovasc. Dis. Res. 2013;4:198–200. doi: 016/j.jcdr.2013.08.001. [DOI] [PMC free article] [PubMed] [Google Scholar]
11. Bailey and Love's short practice of surgery (2018) on clinical surgery edit Professor Sir Norman Williams, P. Ronan O' Connell & Andrew W. Mccaskie (27 th Edition) page no.957
12. Bailey & love's short practice of surgery (2018) on clinical surgery edit by Professor Sir Norman Williams, P. Ronan O' Connell & Andrew W. Mccaskie (27 th Edition) page no.968
13. https://www.ncbi.nlm.nih.gov/books/NBK430858/#article-18685.s9
14. Somen Das (2018) Manual on clinical Surgery(10th Edition) page no. 221

****