

# Peripheral Vascular Disease "A Spectrum"

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## Abstract

**Background:** To observe the spectrum of peripheral vascular disease presenting in a tertiary care hospital.

**Method:** This observational, descriptive study was carried out in Surgical Unit -I at Holy Family Hospital, Rawalpindi over a period of two years. All the patients presenting with peripheral vascular disorders excluding acute vascular trauma patients, diabetics and varicose veins patients were included in the study.

**Results:** A total of 49 patients presented to the hospital. The male to female ratio was 2:1. The average age of presentation was 50.2 years. About 35% patients presented with occlusive disease, 18% with autoimmune disease and 14% with embolism. The less common causes of peripheral vascular disorders included femoral pseudoaneurysms in 8% patients and true aneurysms of iliac, popliteal and subclavian arteries in 12% patients. Bilateral gangrene of both lower limbs was seen in 4% patients.

**Conclusion:** Peripheral vascular disease is commoner in males and is mostly seen in the sixth decade of life. Atherosclerotic occlusive disease is the commonest cause of peripheral vascular disease followed by vasculitis, embolisms and aneurysms.

## Introduction

Peripheral vascular disease (PAD) normally refers to those diseases that affect arteries. The word 'Peripheral' refers to the location of disease. Peripheral vascular disease is predominantly a disease of the lower extremities because collateral pathways are so abundant in the upper extremities that atherosclerosis rarely produces any symptoms.

Peripheral vascular diseases include atherosclerotic occlusive disease, aortic aneurysm, Buerger's disease and others.<sup>1</sup>

Several factors have been linked to

development of peripheral vascular disease. The most important are smoking, diabetes, hypertension, hyperlipidemia, and age.<sup>2</sup>

Smoking appears to be one of the most important risk factors with over 90% of patients with intermittent claudication being current or ex-smokers.<sup>3</sup>

There is no doubt that diabetes mellitus is also very important in the later stages of peripheral arterial disease in which diabetic neuropathy and small vessel disease, as well as atherosclerosis in large vessels, may cause gangrene and ulceration.<sup>4</sup> Similarly hypertension, hyperlipidemia and old age are also associated with an increased risk of cardiovascular disease.<sup>5</sup>

Atherosclerotic occlusive disease is the commonest of the peripheral vascular diseases.

Peripheral vascular disease of the lower extremities remains one of the often-unrecognized manifestations of systemic arteriosclerosis. It has a major detrimental impact on quality of life and is an under recognized marker of multisystem vascular disease.<sup>6-10</sup>

The presence of a true aneurysm often coincides with the occurrence of significant atherosclerosis in the aortic wall, and population studies have shown the two conditions to be inter-related. However, the extent to which atherosclerosis may be involved in the pathogenesis of true aneurysms is not well established.<sup>11</sup>

Management of infected femoral artery pseudoaneurysms continues to be a difficult surgical problem associated with high mortality and morbidity, including limb loss.<sup>12-15</sup>

Peripheral vascular disease may manifest acutely when thrombi, emboli, or acute trauma compromise perfusion. Thromboses are often of an atheromatous nature and occur in the lower extremities more frequently than in the upper extremities.

Emboli, the most common cause of sudden ischemia, usually are of cardiac origin (80%). They also

can originate from proximal atheroma, tumor, or foreign objects.

Among the non-atherosclerotic disorders causing peripheral vascular disease Buerger's disease (Thrombangiitis obliterans) is the commonest. It is characterized by multiple segmental occlusions of small arteries in the extremities distal to brachial and popliteal arteries in most cases.<sup>16</sup>

The objective of this study was to observe the spectrum of peripheral vascular diseases presenting at a tertiary care hospital.

## Patients and Methods

This was an observational descriptive study carried over a period of 2 years in the Surgical Unit I of Holy Family Hospital, Rawalpindi.

All the patients presenting with peripheral vascular disorders, either in the vascular clinic, the outpatient department or emergency were included in this study. Patients presenting with acute vascular trauma, diabetic foot and varicose veins were excluded.

After admission to the surgical unit each patient underwent a complete history and thorough physical examination. During history taking, emphasis was placed on history of smoking, diabetes mellitus, hypertension, ischemic heart disease and lifestyle of the patient.

A complete physical examination including state of limb musculature, extremity hair distribution, peripheral pulses examination and clinical tests like Buerger's angle, Roo's and Adson's test were performed when required to reach a clinical diagnosis. Investigative modalities ranged from simple tests like Blood C.P and blood sugar levels to complex ones including Ankle Brachial Pressure index, Doppler/Duplex and Arteriograms.

After final diagnosis and assessment, patients were managed in different ways ranging from conservative treatment to anatomical bypass and sympathectomies.

## Results

A total of 49 patients were included in the study. Out of these 75 % presented in the vascular clinic of the OPD whereas 25 % presented through the emergency.

The male to female ratio was 2:1. The age of

the patients ranged from as young as a ten year old boy to as old as 75 years. The mean age of presentation for peripheral vascular disease was 62.2 years.

From a total of 49 patients, 30 (61.2%) were smokers, and 20 (40%) were diabetics. Other risk factors like hyperlipidemia (10%) and hypertension (30.6%) were also observed in these patients.

The spectrum of peripheral vascular diseases managed is listed in Table 1.

Occlusive disease (34%) was the most common cause of peripheral vascular disease. Four patients had occlusion in the infra-renal aorta, whereas the majority had occlusion in the iliac and superficial femoral arteries.

As regard the autoimmune causes of peripheral vascular diseases, six out of nine patients had Buerger's disease resulting in peripheral gangrene.

**Table 1 : Spectrum of Peripheral Vascular Disease.**

Disease	Number Of patients	Percentage
Occlusive disease	17	34.60%
Autoimmune	9	18.30%
Embolism	7	14.20%
Femoral Pseudoaneurysms	4	8%
Cervical rib	3	6%
Popliteal artery aneurysms	3	6%
Subclavian artery aneurysms	2	4.08%
Iliac artery aneurysms	1	2.04%
Idiopathic B/L gangrene	2	4.08%
A.V fistula	1	2.04%
Total Patients	49	100%

Myocardial infarction and a trial fibrillation were the main causes of embolisms resulting in peripheral vascular disease. Femoral pseudoaneurysms were seen in 4 patients. One was after trauma and the other three were in I.V drug abusers using their femoral artery as the site of injections. True aneurysms were six in total, one in the iliac, two in the subclavian and three in the popliteal arteries respectively.

Three patients presented with upper limb

symptoms of vascular insufficiency and were diagnosed to have Thoracic Outlet syndrome. All three required surgery to alleviate their symptoms.

Two patients presented with bilateral gangrene of the lower limbs, one was a female who developed these complaints following pregnancy whereas the other was a male who had history of some kind of herbal medicine ingestion. The exact etiology of both these patients was not substantiated.

## Discussion

Vascular medicine has undergone a remarkable evolution in the last two decades. Advances in testing, particularly in the technology used in noninvasive vascular imaging, have led to increased sensitivity and accuracy in disease detection. Progress has also been made in endovascular and surgical techniques, leading to improved limb salvage and quality of life in affected patients.<sup>17, 18</sup>

In our series the mean age of presentation was more than 60 years whereas the male to female ratio was 2:1. According to Weitz et al, in the United States among patients over the age 60 years, 5% of men and 2.5% of women have symptoms of peripheral vascular disease, but nearly three times this amount have an abnormal ankle-brachial index, which suggests a reservoir of asymptomatic disease among people in this age bracket.

Similar series have shown that the risk of disease increases two- to threefold for every 10- year increase in age after the age of 40 years, with men developing claudication about twice as commonly as women.<sup>19</sup> The Framingham Study estimates the incidence of PAD at 26.6 per 1,000 men and 13.3 per 1,000 women less than 65 years old, but in approximately 20 per 1,000 men and women over 65 years of age.<sup>20</sup>

In our study 62% of the patients were smokers and 40 % were suffering from diabetes, proving these two to be the major risk factors in the development of peripheral vascular disease. According to Fowkes et al both cigarette smoking and diabetes mellitus are more important risk factors in the development of peripheral vascular disease as compared to cardiovascular disease, thus underlining the importance of these two factors.<sup>3, 5</sup>

After analysis of data it was found that atherosclerotic occlusive disease (34%) was the

commonest cause of peripheral vascular disease in our series. According to Clagget et al, Hirsch and associates studied the prevalence of atherosclerotic occlusive disease in a multicentre study of adult patients and found that the prevalence of this disease in primary care practice was 29%.<sup>6, 21</sup>

Autoimmune diseases were the second commonest cause of peripheral vascular diseases in our series, among them Buerger's disease accounted for more than 90% of the cases. But in the western countries as well as in Japan the prevalence of Buerger's disease is on the decrease.<sup>22, 23</sup>

Embolism was the cause of peripheral vascular disease in 14% of our cases while western literature has shown a substantial fall in embolic phenomenon. This may be due to a surge in antiplatelet therapy.

Femoral pseudoaneurysms accounted for 8% of our cases; 75% of these patients were I.V drug abusers. Bell et al performed a series on femoral pseudoaneurysms. In his study about 18% femoral pseudoaneurysms were in I.V drug abusers whereas 36% occurred after aorto-bifemoral grafting.

Peripheral artery aneurysms accounted for 12% cases in our study. Two thirds were of the lower extremity and one third were of the upper extremity. Popliteal aneurysms were the most common, accounting for 6% patients of our series. According to McCready et al, isolated iliac artery aneurysms are infrequent, accounting for less than 1% of peripheral arterial aneurysms whereas Dawson et al believe that popliteal artery aneurysms are the most common peripheral aneurysms. They occur in 0.01% of all hospitalized patients and are most often caused by atherosclerosis or trauma.<sup>24, 25</sup>

We also managed 3 (6%) patients with cervical ribs, which were causing vascular symptoms. According to Cuscheri et al cervical ribs are present in less than 1% of the population, and even in them less than one third suffer from vascular symptoms alone.<sup>26</sup>

## Conclusion

Peripheral vascular disease is commoner in males and mostly seen in the sixth decade of life. Furthermore atherosclerotic occlusive disease is the commonest cause of peripheral vascular disease followed by vasculitis, embolisms and aneurysms.

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