# SUMMARY AND CONCLUSION

Peripheral vascular radiology has undergone evolutionary changes in the last 15 years. Diagnostic techniques continue to predominate, but a variety of interventional methods now allow the radiologist to play an important role in the therapy of patients with PVD.

Peripheral arterial occlusive disease of the aorta and greater peripheral circulation (specifically the lower extremities) most commonly arise from arteriosclerosis, although these vessels may be affected by a variety of pathological conditions which usually end by acute or chronic limb ischemia. Its stages range from asymptomatic presentation to limb threatening conditions. Noninvasive vascular laboratory testing is a valuable adjunct to the history and physical examination considering the significant discrepancies not uncommonly found between non-invasive tests and the physical examination.

Angiography is used in patients with disease sufficiently advanced to warrant percutaneous intervention or surgery and is performed in some patients in whom there is diagnostic uncertainty. Coronary comorbidity is extremely common and important. A low AAI is an important indicator of high risk for all causes and cardiovascular mortality even over short term follow up. AAI (s) are inversely related to measures of other cardiovascular risk factors. This recently discovered fact may lead to more aggressive risk-factor reduction in selected patients.

Standard modalities for evaluation of interventional procedures include duplex imaging, doppler wave forms, arterial plethysmography (pulse volume recording), and segmental pressure ratios. The ABI is the most commonly used modality. It is easy to measure and is reproducible, although it may be the least sensitive modality and results may be misleading.

The mainstays of noninvasive management include smoking cessation and a supervised exercise program. Whereas 25% of patients without specific treatment for claudication may be expected to deteriorate to acute and/or severe ischemic conditions, 70% of patients on a monitored exercise program can be expected to improve their walking distance substantially within 6-12 months. The greatest benefit occurs in patients with mild to moderate disease. Recent evidence indicates that benefits may be derived in some patients after as little as 3 months of regular exercise.

Although PTA has lowered the threshold for percutaneous intervention because of its high safety and acceptable efficacy, surgery is generally reserved for more advanced ischemia or for some specific lesions (e.g. isolated CFA lesion). Despite the numerous cases reported, it is difficult to draw conclusions comparing these two modalities because there are so many factors influencing success *(Johnston et al., 1987)*.

The predictive factors for determining a successful PTA outcome include severity of ischemia, length of stenotic segment, tandem lesions, condition of the runoff vessels, medical status, and control of atherogenic risk factors. Patient selection is also a strong influence on success rate. No procedure

is without risk and these must be weighed against the potential benefits. Future studies will determine the appropriate roles of the various newer catheter interventions. As expected, correction of underlying CAD improves long term survival in selected patients undergoing peripheral vascular procedures.

At present there are no data to identify the most appropriate lesions for alternative revascularization techniques such as atherectomy, laser-assisted angioplasty and to a lesser extent stents. This is due in large part to the paucity of well controlled clinical trials that allow an accurate determination of the utility of such techniques. Recent studies suggest that stents may be the only procedure which may improve the long and short term results of angioplasty alone. On the other hand, thrombolysis is evidenced now as a dynamic process reflecting a balance between lysis and concurrent rethrombosis and can significantly improve vessel patency.

**The purpose of this work** is to emphasize the role and reliability of arteriography in the diagnosis and management of peripheral arterial occlusive disease and evaluates its significant complications. The study was carried out at the University of Alabama at Birmingham (UAB) Hospitals, USA. 50 patients with peripheral arterial occlusive disease were divided into six groups depending on the distribution of the vascular disease. All the patients were subjected to diagnostic arteriography. The findings were discussed with the vascular surgeon to choose the appropriate therapeutic approach. Whenever indicated, radiological interventional procedures were carried out in selected patients. The results including benefit outcomes and complications were analyzed and discussed with other studies in the literature.

**In our thesis**, atherosclerosis was the most common cause of the occlusive nature of the disease process (43 patients), followed by trauma (3 patients), vasospastic disorders (2 patient), embolism due to ? myocardial infarction (1 patient), and Burger's disease (1 patient). Complications of the diagnostic study encountered were few and were treated conservatively; most complications were limited to mild to moderate contrast media reaction, puncture site hematoma or renal insufficiency.

A large number and variety of **percutaneous interventions** were undertaken:

44 lower extremities PTA procedures were carried out in this study; usually more than one procedure was carried out for the same patient. The technical and clinical success rates for iliac, femoral, tibial, and graft lesions were (96%-83.5%), (86%-83%), (0%-0%), and (100%-80%) respectively. Clinical failure in spite of technical success was observed in 13% of all patients. The study shows that the success rate is highest in the iliac and may decrease more peripherally. Major complications include distal embolization in 1 patient with an iliac lesion and extensive spiral dissection of SFA in another patient; both required surgical management. The patency rates (from initial success rate) up to a 15 month period were: iliac (87%), femoral (84%), graft (80%). Again, the study shows that the high patency rate was achieved in the iliac segment.

3 stent procedures were carried out in this study; 2 for the CIA(s) and 1 for complicated angioplasty of the SFA. Technical and clinical success was achieved in the CIA lesions (100%) with no complication and long term patency up to a 15 month period. Technical failure was encountered in the complicated SFA lesion with a major complication; dissection which necessitated aggressive surgical treatment (ended by AKA). The study result concerning stent therapy is not reliable due to the small patient population.

11 thrombolysis treatments were carried out in this study, 5 procedures for native arteries and 6 procedures for graft lesions. Adjunct therapy, e.g. PTA and/or surgery was used occasionally. Technical success was 100% with clinical improvement of 81%. Complications noted were: moderate groin hematoma in 1 patient, residual thrombosis and stricture in 1 patient, and arterial spasm in another patient. 12 month patency rate was 81% of the initial success rate. Clearly, the study showed that the ability of thrombolysis to uncover graft failure may be its greatest value.

Upper extremity interventional procedures were not performed. Intra-arterial injection of priscoline was used to enhance the diagnostic findings. The only complications observed in this group was spasm of the brachial artery in one patient.

Briefly, a variety of occlusive disease processes can affect the extremities. These include atherosclerotic disease, thromboembolic disease, trauma, vasculitides, tumors and compression syndromes. A complete angiographic study must be obtained to establish the proper diagnosis and effect appropriate therapy. An adequate study for the evaluation of the extremities will call into play many of the elements that have been discussed earlier. Most patients undergo lower extremity angiography for atherosclerotic peripheral vascular disease. Studies must be individualized for each patient undergoing a procedure, with additional views and/or intra-arterial pressure measurements as necessary.

The history of peripheral vascular recanalization techniques, although not particularly long, is an exceptionally complex and colorful one. It was only a 15 years ago that balloon angioplasty became a reality and, has led to the broad based acceptance of this technology today. Over the past decade, we saw the explosion in biomedical engineering technology driven, to a large extent, by the emergence of coronary angioplasty as a clinical reality and potent economic force. With the advent of reliable long-term clinical studies, the effectiveness of balloon angioplasty in treating peripheral arterial occlusive disease in a wide variety of patients can now be evaluated with considerable accuracy. The emergence of vascular stent placement as an adjunct to balloon angioplasty and other adjunctive techniques will be considered. Last but not least, excellent results with thrombolysis can be accomplished even in the face of severe ischemia (acute ischemia but with viable extremity). Subacute and chronic occlusion, although more time consuming and cumbersome than primary PTA and/or stent placement, may reduce the risk of embolization and improve the results when PTA is attempted without lysis.

In conclusion, optimum care of patients with peripheral vascular occlusive disease can be predicted by accurate clinical assessment, including history, physical examination, and non-invasive testing when appropriate. This data must be integrated by the physician to insure accurate diagnosis and appropriate therapy.

Finally, with the appropriate patient selection, a knowledgeable and expert interventionalist, and available equipment, peripheral arterial recanalization can be a safe , less morbid, less invasive and economic alternative treatment of ischemic limb even in patients with peripheral vascular disease.