

## KSM Oration

Citation: Samarasinghe B, 2023. Navigation through Blood Vessels - My Journey in Vascular Surgery. Sri Lanka Journal of Medicine, pp 31-40.  
DOI: <https://doi.org/10.4038/sljm.v32i1.434>

## Navigation through Blood Vessels - My Journey in Vascular Surgery

*Samarasinghe B*

Consultant Surgeon / Professor in Surgery, Teaching Hospital, Faculty of Medicine, University of Peradeniya, Sri Lanka.

**Correspondence:**

Samarasinghe B  
MBBS, MS  
Consultant Surgeon / Professor in Surgery  
Teaching Hospital  
Faculty of Medicine, University of Peradeniya.  
Email: [bandula.s@gmail.com](mailto:bandula.s@gmail.com)

 : [0000-0002-8592-4063](https://orcid.org/0000-0002-8592-4063)

### Mycotic aneurysms

At the beginning of my surgical career, one of the commonest operations that were performed for acute ischaemia was embolectomy. Majority of them were secondary to bacterial endocarditis and other forms of heart diseases. It was observed that some of these infective emboli lead to form mycotic aneurysms. Thus, we studied a number of similar cases presented to TH Peradeniya with similar problems.

An aneurysm is an abnormal focal arterial dilation more than 150% of its original diameter. The term mycotic aneurysm was coined by William Osler to describe aneurysms associated with bacterial endocarditis. Although the term mycotic implicates fungus, the majority of mycotic aneurysms are caused by bacteria. Embolomycotic aneurysms occur when material originating in the heart causes arterial wall infection and, subsequently, dilation.

In this study ten cases associated with infective aneurysmal diseases were studied.

Infective emboli from vegetations of infective endocarditis are known to cause ischaemic syndromes in limbs and viscera. They are also known to cause infective damage to arteries leading to aneurysmal change.

The latter are referred to as embolomycotic aneurysms. Such aneurysms can rupture and when they do so freely into the peritoneal or intracranial cavities, they could have lethal consequences.

The prevalence of such complications of infective endocarditis has been on the wane since the advent of antibiotics. The development of in the field of cardiology further reduces these infective complications. At the time of this study infective complications of prosthetic grafts have tended to mask the existence of these infective endocarditis sourced complications. However, the disease burden of complicated infective endocarditis was significant and was highlighted by this study.

We reviewed ten patients admitted to University Surgical Unit of TH Peradeniya from 1986 to 2004. The clinical details, operative details and follow up were retrospectively analysed from meticulously maintained operative notes, bed head tickets and clinic follow up records. There were four patients with mycotic embolism, five patients with embolomycotic aneurysms and one patient who developed infective endocarditis following traumatic arterio venous fistulation.



Table 01: Mycotic Embolisms

Case Initials	Age	Sex	Race	Source-emboli	Location-embolus	Delay from onset to presentation (hrs)	Clinical State of the Limb	Procedure	Results
1. H	15	M	T	RHD IE	Femoral with iliac propergation	72	Leg + foot cold	Embolectomy	2 weeks later died hemiplegia
2. SM	21	F	S	RHD MS MR IE/AF	Iliac	72	Slight movement of toes	Embolectomy	Poor recovery
3. MSM	66	M	M	MR AF	Fempop	168	Cold leg and gangrene /foot	Embolectomy and TKA	LVF
4. RD	22	F	S	RHD	Fempop	24	Cold foot	Embolectomy	Good

IE – infective endocarditis, RHD – rheumatic heart disease, MS – mitral stenosis, MR – mitral regurgitation, AF – atrial fibrillation, TKA – through knee amputation

They belonged to both the genders, all ethnic groups and embolisms were seen in proximal arteries of lower limbs. All the patients had embolic source originating from heart. The earlier the presentation the better the outcome.

Table 02: Embolomycotic aneurysms

Case Initials	Age	Sex	Race	Disease/valve	Location/aneurysm	Nature of lesion	Procedure	Result
5a SDC	41	F	S	Rh carditis aortic valve	Iliac	False aneurysm	Evacuated / graft reconstruction	Good
5b SDC	57	F	S	Aortic valve	Bracheal	Aneurysm	Reconstructed	Good
6a DMD	22	F	S	Rh carditis mitral valve	Femoral	False aneurysm	Evacuated and tied off	Good
6b DMD	22	F	S	Rh carditis mitral valve	Cerebral	Ruptured aneurysm	Managed conservatively	Good
7 W	29	M	S	Rh carditis	Post tibial	False aneurysm	Evacuated and tied off	Good

8 MPR	37	S	M	Bicuspid aortic valve	Post tibial	False aneurysm	Evacuated and tied off	Good
9 SJ	62	S	M	Calcified aortic valve	Peroneal	False aneurysm	Evacuated and tied off	Good

Embolomycotic aneurysms were found in these five patients. One patient had two aneurysms presented sixteen years apart. Another patient had aneurysms at more than one site at the same admission. There was no difference between two genders. Interestingly all of them belonged to a single ethnic group. However, the sample size was too small to come to a conclusion. They affected proximal limb arteries, distal limb arteries and other arteries. All of the patients had a good outcome.

Infective endocarditis following traumatic arterio venous fistulation. A forty-two-year-old patient developed a traumatic arterio venous fistula following a trap gun injury to the right thigh. Secondary to that he developed grade iii – IV aortic incompetence and multiple vegetations attached to the edges of the three cusps of aortic valve.

We concluded that infective endocarditis is not an uncommon disorder in Sri Lanka and the cases presented highlight the need for vigilance of extra cardiac complications of the disease.

Our analysis was published as a case series in Sri Lanka Journal of Medicine in 2007.

### Vascular trauma

Combat vascular injuries often combine massive soft-tissue destruction with osseous and neurological trauma. Further complicating the situation, the surgeon has to serve in a setting that is far from ideal and lacks valuable resources. In current conflicts, surgeons generally attempt limb salvage unless the extremity is so badly mangled that salvage is pointless or orthopedic reconstruction is unavailable, based on the degree of soft-tissue and nerve damage and extent of bony injury.

The objective of this study was to provide an account of wartime extremity vascular injury in a local military conflict in Sri Lanka from the unique perspective and setting of a wartime military

hospital. An additional objective was to analyze management strategies related to vascular reconstruction and to report early infection, limb salvage, and mortality rates.

All adults with extremity vascular injuries admitted to the MBH from November 2008 to June 2009 were prospectively recorded on a data sheet and retrospectively analyzed. Extremity vascular injuries include those in which limb salvage assessment was attempted. Patterns of injury were documented, noting the mechanism of vascular injury, anatomical distribution, and the presence of associated nonvascular trauma. The mechanism of injury was categorized as either gunshot wound or explosive devices with shrapnel. Vascular injuries were characterized by type (arterial, venous, or a combination thereof) and macroscopic description (transection, laceration, or thrombosis of vessels).

Vascular repairs were classified into four methods of treatment: ligation, primary repair (including patch angioplasty), interposition autologous vein graft, and open vessel exploration with thrombectomy. The great saphenous vein was the conduit of choice in both the upper and lower extremities. The contralateral vein was taken preferentially for lower extremity injuries, although the ipsilateral vein was required in few cases. In nearly all cases, vascular repair was attempted within the first hours from the time of admission.

Early outcomes were determined, including the need for delayed amputation, graft thrombosis, infection with late anastomotic disruption, and death. Short-term follow-up data were reviewed. Lower extremity was the most frequent site for arterial vascular injury. Most arterial injuries required an interposition vein graft. Concomitant arterial and venous injuries were present in 58 lower and four upper extremity cases, while isolated venous injury was found in 12 cases. The

mortality in the 128 patients with extremity injuries was 3.1%.

There was a total of 20 postvascular repair complications (5.5 %), which included ten graft thromboses; five anastomotic disruptions resulted in five delayed amputations.

We concluded that the factors that may have contributed to this are (among others) rapid evacuation of injured soldiers from the battlefield in helicopters, advances in echelon care, damage control resuscitation, and the use of new techniques: TIS and early fasciotomies. The low rate of extremity vascular injuries (2.2 %) in this series in comparison to other contemporary wars in Iraq and Afghanistan (12 %) may have been a result of more soldiers with extremity vascular injuries dying on the way to the third echelon, as the average time taken was 5.5 h (as compared to 2 h in Iraq).

We demonstrated that in a hospital with limited modern diagnostic facilities in a developing country, peripheral vascular trauma can be managed successfully by early recognition, clinical diagnostic skills, and expert surgical repair. In the military settings with long transportation time, early fasciotomy prior to definitive vascular reconstruction result in a better outcome. Autologous saphenous vein graft interposition remains the treatment of choice for the majority of vascular injuries. Popliteal vessels injuries are most challenging and associated with a high amputation rate. TIS are a favorable option in the severely injured and when the ischemic time has exceeded 6 h. TIS also facilitates limb perfusion prior to transfer to a higher level of care. Complications are mainly due to technical errors and infections. Surgeons in military hospitals should be trained in vascular injury repair to save the lives and functional limbs of patients.

The results of this study were published in abstract form in Annual Academic Sessions 2011, College of Surgeons of Sri Lanka and as an original article, Penetrating peripheral vascular injury management in a Sri Lankan military hospital in European Journal of Trauma and Emergency Surgery in 2012.

In modern warfare, tourniquets have been proven to save lives in exsanguinating extremity hemorrhage and in the era of mature medical evacuation, time to definitive care is less than two hours. Prolonged medical evacuation time is a huge problem in certain war territories. During the Sri Lankan Civil War, medical evacuation to definitive surgical care was an average of six hours. In situations such as these, novel strategies for hemorrhage control may be required.

We analyzed the methods we used to control haemorrhage during medical evacuation. We concluded that based on the experience from the Sri Lankan civil war, an alternative to tourniquet application in extreme prolonged patient evacuation could be packing with haemostatic agents and monitoring for further bleeding.

These findings were published as a poster in Association of Military Surgeons of the United States in 2019.

It was obvious from the above study that the most frequent and the most critical site of lower extremity vascular trauma is popliteal artery. Therefore, we then analyzed the popliteal vascular injuries.

Popliteal artery injuries constitute 3–5% of all extremity artery injuries on the modern battlefield. They also have the highest rates of amputations amongst all lower extremity vascular injuries despite advancements in modes of intervention. Today amputation rate is less than 10% thanks to experience gained from war surgery, earlier surgical intervention, the use of broad-spectrum antibiotics and vascular grafts.

The management of such injuries is a challenge for general and vascular surgeons in developing countries with limited resources. The objective of this study was to review the experience in the management of PAI and determine the most influential factors in the decision between attempted limb salvage and amputation. The primary outcome was limb salvage. The secondary outcome was morbidity (graft infection, delayed graft occlusion (thrombosis) and delayed haemorrhage). Also, factors associated with decision for primary amputation were evaluated.

Data from all adults with extremity vascular injuries admitted to the Military Base Hospital Anuradhapura (MBHA, the level 3 facility) from November 2008 to June 2009 were prospectively recorded. Out of a total of 129 patients with vascular injured limbs 44 popliteal vascular injuries were identified. The study group of 39 (89%) patients with PAI was analyzed for demography, management and early outcome. Mechanism of injury was categorized as caused by gunshot wounds, blast fragments and unidentified objects. Vascular injuries were characterized by type (arterial, venous or combination) and macroscopic description (transection, laceration, through and through, primary thrombosis).

Vascular repairs were classified into four methods of treatment: ligation, primary repair (including patch angioplasty), interposition autologous vein graft and open vessel exploration with thrombectomy. The great saphenous vein was the conduit of choice. The contralateral vein was taken preferentially for PAI, although the ipsilateral vein was required in few cases. In nearly all cases, vascular repair was attempted within the first hours from the time of admission.

Temporary intra-luminal shunting was used in eight cases. Sterile intra-venous infusion tubing was used as a temporary shunt. Indications for shunting were either prolonged ischaemic time, or hypovolaemic shock.

There were thirteen wound infections, 5 early graft occlusion, 2 anastomotic disruptions and 4 delayed amputations. Four out of 5 thromboses were due to technical errors during vascular reconstruction with one leading to delayed amputation in day 3. Anastomotic disruptions in 2 patients required ligation of the popliteal artery, one resulting in delayed amputation on day 3. One patient had delayed amputation due to limb infection 8 days after IPVG. One delayed amputation was performed less than 24 h after damage control ligation of the transected popliteal artery with non-viable muscles.

We showed that the often quoted 6 h critical ischaemic time is not always applicable in military vascular injuries. Wagner et al. found a lack of correlation between ischaemia time and outcome

in vascular injury. Other authors have pointed out that the severity of tissue ischaemia depends not only on its duration but also on the level of arterial injury, the extent of soft tissue damage and the efficiency of collateral circulation. Additionally, the time since injury, may not necessarily reflect the actual period of ischaemia especially in closed vessel injuries. In this case series limbs with less than 3 and a half hour ischaemic time ended up in amputation, while limb of 16 h of critical ischaemic time was salvaged. Associated venous injury results in muscle swelling and compromises arterial reconstruction by reducing arterial flow as a consequence of inadequate venous drainage. Thus, venous repair has been thought to enhance the success of the arterial reconstruction by facilitating runoff and decreasing compartment pressure.

Although modern warfare is associated with more severe popliteal artery injuries, improved resuscitation and surgical support has contributed to better surgical results. Limb injury severity (MESS) may not indicate a life-over-limb strategy for popliteal arterial repairs. Isolated lower extremity trauma with vascular injury is associated with a nearly 10% rate of mortality or limb loss. Mortality is associated with penetrating injury and early shock, likely resulting from pre-hospital proximal arterial haemorrhage. In contrast, early limb loss is more common with blunt distal vascular injury, especially to the popliteal and tibial arteries.

In this case series of popliteal injuries, we concluded that early identification of limbs at risk and subsection of those limbs to maximum adjuvant care of early four compartment fasciotomy, temporary intra-luminal shunting, definitive repair of concomitant venous injuries and aggressive resuscitation of the haemodynamically unstable were proven to be beneficial in achieving reasonable outcome in the military environment with limited resources.

The findings of this study were published in abstract form in Annual Academic Sessions 2013, College of Surgeons of Sri Lanka and as a full paper in Injury – International journal of the care of the injured in 2014.

In the early days of military vascular trauma arterial injuries were given priority over venous injuries. During the Korean War, for the first-time arterial injuries were repaired definitively on a large scale, followed by repair of vein injuries in the Vietnam War. Credit for the appreciation of the benefits of venous repair in combined arterio-venous injuries in combat wounds is attributable to Rich et al who highlighted the importance of venous repair in preventing a low flow state with particular emphasis on the popliteal region, as routine venous ligation had been the accepted practice during the first half of the 20th century. During the recent wars in Iraq and Afghanistan, the management of wartime venous injuries paralleled that of the Vietnam experience with about one-third of venous injuries managed either primarily or with autogenous vein repair. Clouse et al recognised the worthiness of venous reconstruction when achievable, given that all limbs lost early had concomitant venous injury. Development of efficient transportation ambulance services, far forward surgical teams and frontline war hospitals contributed to the reduction of postoperative morbidity of injured patients.

Our aim was to analyze a recent experience with combat extremity venous injuries in a high burden Sri Lankan war theatre and to compare the effects and outcome of combined arterial and venous injuries with isolated venous or arterial injury. Venous injuries were characterized by type (isolated venous or combination with artery) and macroscopic description (transection, laceration, through and through, thrombosis). Venous injury repair techniques were classified into ligation, primary repair, patches angioplasty and interposition autologous vein graft—greater saphenous vein was the conduit of choice. Unfractionated heparin was used as the anticoagulant due to the unavailability of low molecular weight heparin during this period at the MBH. Associated brachial venous injuries were routinely ligated due to the non-critical nature of this injury. Early outcomes were determined, including need for delayed amputation, graft occlusion and infection with late anastomotic disruption and mortality.

We examined 123 vascular injuries of north – east conflict of Sri Lanka in 2008 and 2009. A total of 53 had isolated arterial injuries and are not examined in detail, 58 (83%) had combined arterial and venous injuries and 12 (17%) had isolated venous injuries. There was no significant difference in incidence of femoral versus popliteal vein injuries (34 vs. 30 patients). Time from injury to definitive care was recorded in 56 (80%) patients. For those with isolated venous injuries the mean time to definitive treatment was significantly longer compared with either isolated arterial or combined vascular injuries ( $p=0.0002$  and  $p=0.008$ ).

The principle in venous injuries in this series was to repair simple injuries by the simplest measure that would establish the venous outflow, which was exemplified by the fact that only 4/47 transactions were repaired but 21/27 lateral tears were repaired.

Our conclusions were in combat extremity vascular trauma vein ligation rather than repair was the practice due to the number of casualties, limited time available in theatres and the extreme state of the patients presenting to definitive care with haemorrhage and shock. In certain instances, repair of concomitant venous injuries is vital to limb survival with particular emphasis on the popliteal zone. An aggressive use of intraluminal shunting of both artery and vein at an early echelon of care, prophylactic fasciotomy and an aggressive approach to venous repair of these injuries at higher echelon of care may prevent inadvertent limb loss in these challenging scenarios.

The findings of this study were published as an original article, Challenges encountered, and lessons learnt from venous injuries at Sri Lankan combat theatres in Journal of the Royal Army Medical Corps in 2016.

During the final phase of Sri Lankan civil war majority of vascular injuries were managed at Military Base Hospital, Anuradhapura. The majority of arterial injuries were repaired with an interposition autologous vein graft 92% (80/87) and 8% (7/87) had a lateral repair with autologous saphenous vein patch. Fasciotomies were performed in 52% (46/87). 77 limbs out of total 87

arterial reconstructions (88.5%) were viable upon discharge from MBH with an average 17 days in hospital follow-up. We analyzed arterial blow outs (5/87 or 5.7%) which occurred at the MBH with a meantime of 14 days.

All the arterial anastomotic blow outs were managed with ligation. Extra anatomic reconstruction was not considered as it was time consuming in management of a large number of military casualties.

Despite ligation, only one patient had to undergo an above knee amputation. Other limbs survived and were viable on discharge.

We concluded that in the current context of war, extremity trauma predominates with rising trends in vascular injuries, often associated with soft tissue injury and long bone fractures. In combat situations, contamination from environment and fragments of explosive devices will invariably lead to soft tissue infections. Inadequate primary soft tissue and vessel debridement, faulty techniques in vascular reconstruction, less than ideal skeletal management, exposed newly constructed vascular repair, will subject repair to arterial blow out with potentially catastrophic consequences. Although in this series, all arterial blowouts were ultimately ligated with a minimal need for amputation. This article calls for more emphasis in further research into early soft tissue closure in war time extremity vascular injuries and proposes an algorithm for such timing and techniques.

Based on our findings we formulated an algorithm for combat soft tissue injury management. The findings of this study were published as Registry-Based Clinical Study, Identification of risk factors for arterial repair failures and lessons learned in the Journal of Trauma and Acute Care Surgery in 2019.

### Vascular Surgery – Routine work

The formal vascular surgery in Sri Lanka was initiated by two great personalities of surgery in the country.

Prof AH Sherifdeen established the vascular unit in Colombo and Prof PCA Ratnatunga established the other vascular unit within the University Surgical Unit of Peradeniya. Since then, Peradeniya unit accepts all vascular admissions and referrals 24 X 7 days.

I carry out the major burden of vascular work since I joined the unit in 2012. The amount of work we do is in par with other vascular units of the country. I would like to share the average summary of work done by us during last few years.

The vascular workload we do was appreciated by the Specialty Board of Vascular Surgery of Post Graduate Institute of Medicine of University of Colombo. They considered our audit and allowed us to train senior registrars in vascular and transplant surgery from 2017. In fact, this is the only general surgical unit in the country which is eligible to train higher surgical trainees in Vascular and Transplant surgery.

Primary vascular access – AV fistula	50-70
Abdominal aortic aneurysm (AAA) open repair	08
Peripheral arterial revascularization – infra-inguinal	18-22
Peripheral arterial revascularization - Supra-inguinal	10-12
Carotid endarterectomy	6-8
Endo Venous Laser Ablation	25-30

Live donor renal transplantation - paediatric 10-12	
Deceased donor renal transplantation	5-6
Live donor nephrectomy	10-12
Peritoneal access for dialysis	15-20

It is important to identify anatomical variations of the human body. This is especially important for surgeons involved in vascular surgery. Being vigilant on these variations helps you to identify anomalies. In a patient with intestinal obstruction a CT scan was performed which showed a double inferior vena cava. We reported this in Case Reports in Surgery in 2016.

Peripheral arterial disease is the main territory of the vascular surgeon. However, patterns of vascular disease are different in different geographical areas. The pattern of arterial occlusion in peripheral arterial disease (PAD) also depends on associated risk factors. This has been studied in relation to diabetes mellitus. However, it is not much studied in relation to hypertension. To assess the pattern of arterial occlusion in PAD in patients who presented with critical limb ischaemia (CLI) in relation to their associated risk factors, a pilot study was carried out with 20 patients who presented with CLI to a tertiary hospital over a period of two months. The demographic data and occluded arteries were documented. The pattern of occlusion is obtained by analyzing the computerized tomography angiogramme (CTA) by a single surgeon.

We concluded that more males present with CLI than females. CLI affects males earlier than females. Hypertension is associated with distal PAD more. However, this needs to be validated in a large-scale study.

This was published in abstract form in annual academic sessions of Kandy Society of Medicine 2021.

Burger's disease was a common vascular surgical problem some time back. Fortunately, the prevalence of this disease has gone down. Although it is less common in current practice, it is

often neglected mainly due to non reconstructable distal arterial disease. Often these patients end up in some form of amputation.

We selected a few young individuals with Burger disease and subjected them for arterial imaging by means of CT angiogrammes and subjected them distal arterial bypass surgeries. Outcome was favorable and we were able to salvage the limbs. We concluded that revascularization and limb salvage is possible in some patients with Buerger disease. Therefore, imaging of the arterial tree should be considered in these patients. Reconstruction surgery brings a favorable outcome.

This was published as a case report in the annual academic sessions of Kandy Society of Medicine 2021.

Aneurysms or focal arterial dilations poses unique problems to the vascular surgeon. True aneurysms have all the layers of arterial wall while false aneurysms do not. It is seen more frequently in major vessels such as aorta and major limb vessels. Visceral artery aneurysms are rare.

We reported a hepatic artery saccular aneurysm in a 40-year-old female who presented with upper abdominal pain. Arterial imaging was done using CT angiogramme. It is known that risk of rupture is 80% and mortality is 40%. We repaired this aneurysm with conventional surgery without any hiccups.

This was published in abstract form in annual academic sessions of Kandy Society of Medicine 2021.

Expertise I developed by involving more with vascular surgery allowed me to extend a helping hand to other disciplines. The incidents are many, I would like to mention a 3-year and 10-month-old



child who had a giant thoracic ganglioneuroma encroaching thoracic aorta. I was called to give a helping hand and we successfully resected the tumour. It was published in Annals of Paediatric Surgery in 2020.

### **Transplantation and vascular access**

I joined the paediatric kidney transplant programme at Teaching Hospital Peradeniya in 2012. Since then, I have been involved in all the transplant related surgeries. In adults' indications for transplants have been studied for Sri Lanka and were found to be unique in certain diseases. This was not established in relation to paediatric transplants. We analyzed our database, which is nearing 150, to find out the indications for kidney transplants in children.

The aetiologies were categorized to 7 categories (glomerulonephritis, congenital anomalies of kidney and urinary tract (CAKUT), familial nephropathy, nephritic syndrome, cystic renal disease, renal parenchymal disease and other causes). It was analyzed according to the age (<10y and >10y) and gender.

We concluded that it is clearly evident that aetiology of paediatric ESRF who undergoes transplantation is different from adults. However, it does not demonstrate a difference with the other parts of the world. Most of the children who undergoes renal transplants are due to CAKUT; and majority of them are males. The second commonest indication was glomerulonephritis where there is no significant difference between genders. Both these aetiologies, if detected early, could be managed properly either preventing or delaying the onset of ESRF. It is important to identify vulnerable children and treat them in order to reduce the burden on health care systems.

This was published in Proceedings of Peradeniya University International Research Sessions 2021. All the transplants carried out in our programme were live donor transplants. However not all the donors bear same relationship to the patient. We analyzed our data in order to find out the correlation between the outcome and donor relationship. There were 81% of first-degree

relatives while 5% were second degree relatives. 14% were nonrelated donors.

We concluded that first degree relatives are the commonest donors in paediatric renal transplants in Sri Lanka. Graft rejection either acute or chronic was less common among them. Higher rejection rates were observed in patients who had nonrelated donors or second-degree relative donors.

This was published in Proceedings of Peradeniya University International Research Sessions 2017. Renal replacement therapy is needed to maintain homeostasis in patients with stage 4 chronic kidney disease. They need either haemodialysis or peritoneal dialysis. Each of these modalities has its advantages and disadvantages. Haemodialysis is hospital-based while peritoneal dialysis could be performed in the community. CAPD has gained popularity worldwide. The catheter insertion is mostly done laparoscopically in most other countries. In Sri Lanka, CAPD is being utilized increasingly. CAPD has gained more popularity among patients, caregivers and healthcare personnel with appropriate counselling and training. In most centres in Sri Lanka CAPD is inserted by open surgery. Laparoscopic insertion is relatively new to local patients. Being a minimally invasive procedure, post-operative pain is minimal. Loops of the small bowel and large bowel can be moved away from the pelvis and space for the tip of the catheter can be created. The catheter is placed in the pelvis under direct vision. Since all the steps are done with direct vision, bleeding, bowel and bladder injuries could be minimized. I did a retrospective study to analyze the initial outcome and safety of the technique.

My conclusion was Laparoscopy is a safe, reliable mode of CAPD catheter implantation. It is feasible to achieve good results even in low resource settings with technical modifications. However, it should be further evaluated with larger studies although early results are encouraging.

The results of this study were published in abstract form in abstract form in annual academic sessions of Kandy Society of Medicine 2021. A full paper was published as a Scientific Article, Laparoscopic continuous ambulatory peritoneal dialysis (CAPD) catheter insertion: a modified technique in low

resource settings and early outcome, in Sri Lanka Journal of Surgery in 2021.

Vascular surgery deals with aging blood vessels. The prevalence of vascular diseases has also been on the rise as a result of change in population demographics. This is true both locally and globally. Thus, the role of the vascular surgeon becomes much significant in the management and research work in the discipline of vascular surgery. I sincerely hope that I have contributed to the development and research of the discipline. However much more work has to be done in the future. I hope my current research projects in aortic surgery and paediatric renal transplants will help for the betterment of patient care with vascular diseases.