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Original Article:

Fasciotomy done for vascular trauma at a tertiary care centre in Sri Lanka.

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ABSTRACT

Introduction Compartment syndrome is a major factor contributing to limb loss and poor outcome following lower limb vascular injuries.

Method

This is a retrospective study done on patients with vascular injuries and undergone fasciotomy at the accident service operation theatre (ASOT) at the national hospital of Sri Lanka (NHSL), during a period of one year. Cases with Incomplete documentation were excluded. Data on patient demographics, time of injury, and time of fasciotomy, associated fractures, muscle viability and outcome were collected.

Results

A total of 30 cases were included. 26 (86%) were males. Nine (30%) were upper limb and 21(70%) were lower limb fasciotomy. The cause for limb injuries were road traffic accidents (RTA) in 18 (58.1%), trap gun injury in five (16.1%). All the fasciotomy were done prior to revascularization. 19 (63.3%) had fractures (12 (63%) were open and seven (36%) closed). six (20%) fasciotomy were done for compartment syndrome, 24 (80%) were done prophylactically. Three patients with compartment syndrome had open fractures (50%) and three had closed fractures (50%).

On fasciotomy, in four cases all four leg compartment muscles were non-viable, two had non-viable three compartments and one patient had non-viable two compartments. The mean delay in patients who had all compartments viable was 3.7 hours (2-6.5) and the mean delay in patients with three or four non-viable compartments was 12.2hours (7-24). This difference was statistically significant (p-0.0001). The fasciotomy delay was also significant (p-0.0001) between the patients who had an amputation and limb salvage. Overall amputation rate was 20% in this series. Mean time of delay from admission to NHSL to the time of fasciotomy was 1.8 hours (1-3.5). Mean time of injury to time of fasciotomy was 5.42 hours (2-24).

Discussion

Number of non-viable compartments is significantly associated with the duration between time of injury to time of fasciotomy(P-0.0001). Therefore we suggest early fasciotomy before transfer.

Introduction

Compartment syndrome is increased intra compartmental pressure resulting in reduced tissue perfusion within the compartment. Compartment syndrome is a major problem contributing to muscle death and poor outcome following lower limb injuries. The percentage of patients developing compartment syndrome and needing fasciotomy varies between 28% to 62% [1,2]. Following limb trauma, fasciotomy is performed for the following purposes, i.e. Therapeutic, prophylactic and diagnostic purposes.

Therapeutic fasciotomy is done when the patient already has an established compartment syndrome. Prophylactic fasciotomy is done on a patient who has a high risk of developing compartment syndrome. Whereas the diagnostic fasciotomy is done when there is a need to assess the viability of the compartments. Delay in fasciotomy results in death of the muscles and finally the limb. There are many patients who presents with compartment syndrome at the accident service at the national hospital of Sri Lanka (NHSL). Data on such patients are lacking. Therefore this study was done to assess the existing practices related to the compartment syndrome following limb trauma.

Method

This is a retrospective study done on patients with vascular injuries and underwent fasciotomy at the accident service operation theatre (ASOT) at NHSL, during a period of one year. Data were collected from the admission records, the theatre register and the operation notes. Data on patient demography, time of injury, and time of fasciotomy, associated fractures, muscle viability and outcome were collected. Cases with Incomplete documentation were excluded.

Results

A total of 30 cases were included. 26 (86%) were males and four (13%) were females. Nine (30%) were upper limb fasciotomy and 21(70%) were lower limb fasciotomy. The cause for limb injuries were road traffic accidents (RTA) in 18 (58.1%), trap gun injury in five (16.1%). All the fasciotomy were done prior to revascularization. 19 (63.3%) had fractures, out of them 12 (63%) were open and seven (36%) were closed fractures.

Six (20%) fasciotomy were done for compartment syndrome and 24 (80%) were done prophylactically. Three patients with compartment syndrome had open fractures (50%) and three had closed fractures (50%).

On fasciotomy, in four cases all four leg compartment muscles were non-viable, two had non-viable three compartments and one patient had non-viable two compartments. The mean delay in patients who had all compartments viable was 3.7 hours (2-6.5) and the mean delay in patients with three or four non-viable compartments was 12.2 hours (7-24). This difference was statistically significant (p-0.0001). The fasciotomy delay was also significant (p-0.0001) between the patients who had an amputation and limb salvage. Overall amputation rate was 20% in this series. Trap gun injuries resulted in higher rate of amputation (66.6%) than penetrating trauma (33.3%). 22 fasciotomy (73%) were performed within 6 hours of injury. 60% patients presented to accident service within 2 hours of the injury. Mean time of delay from admission to NHSL to the time of fasciotomy was 1.8 hours (1-3.5). Mean time of injury to time of fasciotomy was 5.42 hours (2-24).

Discussion

Number of non-viable compartments is significantly associated with the duration between times of injury to time of fasciotomy. (P <0.0001).The risk of amputation is also directly associated with the delay. Closed fractures were associated with more completely non-viable limbs (1/10vs3/12).

Leg is a common site of vascular trauma and compartment syndrome. It has four compartments; namely the anterior compartment, Lateral compartment, deep posterior compartment and superficial posterior compartment (Figure 1).

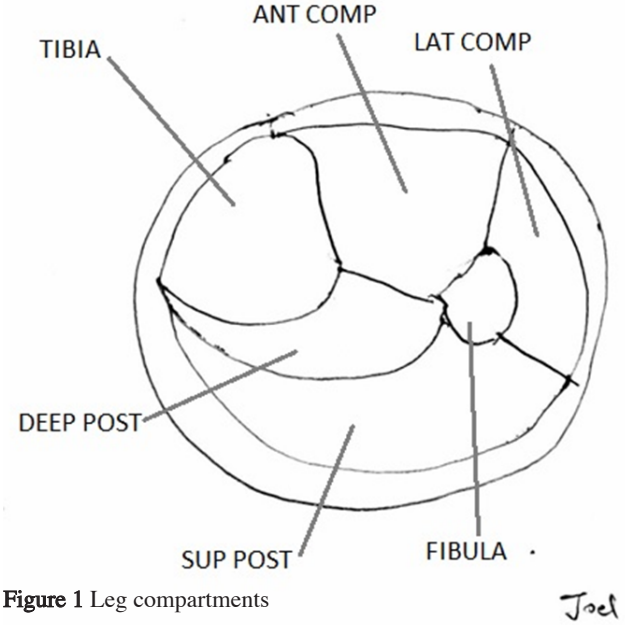

Figure 1 Leg compartments

Fasciotomy in the leg can be done through two methods i.e. Single incision fasciotomy, Double incision fasciotomy. Single-incision fasciotomy is done through an incision on the lateral aspect of the leg. The double incision fasciotomy is done through two incisions on medial and lateral aspects of the leg. The disadvantages of double incision fasciotomy in case of trauma include; Additional length of wounds for the patient and the medial incision on the leg it may cause problems with popliteal arterial exploration and closure of the wound .Therefore single incision fasciotomy can be performed with minimal discomfort to the patient exposing all the compartments adequately (Figure 2).

Studies have found that development of compartment syndrome results in poor limb salvage [3] and there are no reliable factors to predict the development of compartment syndrome. This can happen especially during long transfers of the patients. Studies have also demonstrated that the development of compartment syndrome also results in increased mortality [4]. Therefore early prophylactic fasciotomy is advisable. Some studies have found that the risk of developing compartment syndrome is more with combined arterial and venous injuries, with increased blood loss, open fractures and joint dislocations [5,6]. These studies suggest to do fasciotomy in patients with risk factors for development of compartment syndrome.

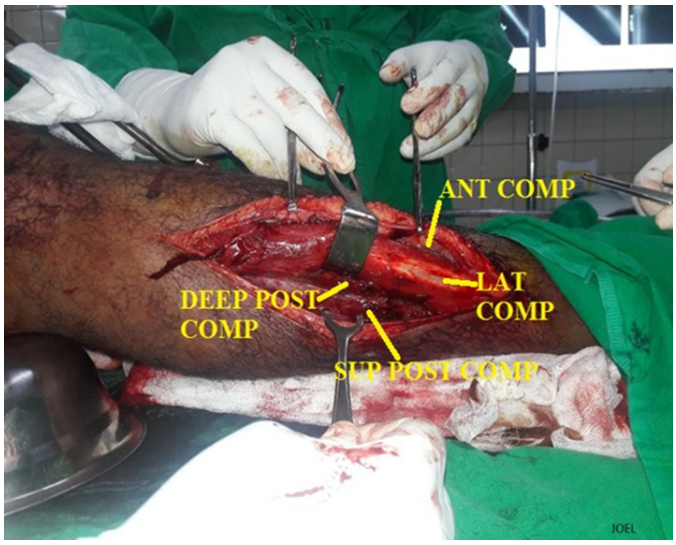

Figure 2 Single-incision fasciotomy

Conclusion

The compartment syndrome results in increased limb loss and increased mortality. This study has shown that the delay in performing fasciotomy is significantly associated with limb loss. Therefore single incision prophylactic fasciotomy should be done under local anaesthesia early and before the transfer of the patients to the vascular trauma centres. In future the steps should be taken to minimise the delays in performing the fasciotomy.

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