

Increasing the knowledge and awareness on Compartment syndrome within the Day Surgery setting

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Abstract

Compartment syndrome is a pathological condition characterized by a micro vascular insult in a closed soft tissue compartment [1]. By recognising the signs and symptoms of this condition quickly it can be treated with intervention and minimal fiscal implications.

To assess the knowledge of Day Surgery Nurses regarding this condition, a questionnaire was developed, then following results of the questionnaire several actions were put in place to raise the awareness, this questionnaire was then re distributed to see if the knowledge had increased.

Introduction

Compartment syndrome is a clinical diagnosis and if missed or not suspected it can cause devastating complications such as severe and permanent muscle atrophy, loss of sensation or even amputation, and in extreme circumstances it can result in loss of life [2].

Due to the recent introduction of a Day Case Trauma Pathway in Withybush hospital, it is vital that the nurses working in the Day Surgery environment are aware of compartment syndrome but more importantly they are competent and confident in recognising the signs and symptoms quickly to avoid the development of compartment syndrome. The Day Surgery setting is fast becoming an option for orthopaedic surgeons when admitting trauma patients that require surgical intervention.

The county of Pembrokeshire has a population of 375,000 however it is also a very popular tourist destination throughout the year, thus increasing this number greatly, of any potential patients that may require trauma surgery. If deemed fit patients would be able to be placed onto the Day Case trauma pathway thus freeing up the inpatient beds and reducing the length of stay.

The aim of this audit was to:

Assess the level of awareness with regards to this condition amongst the Day Surgery Nurses who are often the first port of call in an emergency admission and

To identify gaps in the knowledge regarding this condition. Therefore it is imperative that all staff dealing with these admissions are fully aware of the risks, signs and symptoms, and

That they are confident in administering the appropriate medical and nursing interventions required in evaluation and monitoring of this extremely serious phenomenon.

Methods

To assess the initial awareness of Compartment Syndrome amongst Day Surgery Nurses a questionnaire was devised (fig1). The questionnaire was distributed to the Nurses for completion, which was anonymous. All the participants had the option of selecting a close question response in addition to multiple choice questions.

After the initial audit results were collated including definition, aetiology, symptoms, signs, immediate response on suspicion of compartment syndrome and the outcome if compartment syndrome if not recognised quickly. It was found that the awareness and knowledge regarding compartment syndrome was suboptimal.

An action plan was put in place and within the action plan there was a lecture open to all staff on Compartment Syndrome, RCN [3] (Fig2) and BOA [4] (Fig2) guidelines for Compartment Syndrome were displayed on the ward, also a poster with a flow chart detailing signs and symptoms which included guidelines on what to do if Compartment Syndrome is suspected. This acted as a quick systematic guide to follow and would aid in the early recognition on the condition.

The same questionnaire was then distributed 3 months later to close the loop of the audit to assess if the level of awareness had increased following the action plan following the initial audit and also to find out the impact of these interventions.

COMPARTMENT SYNDROME AWARENESS AMONGST DAY SURGERY NURSES

Please could you complete this questionnaire by placing a tick next to the most appropriate answer. There could be more than one answer for each question:

Compartment syndrome is defined as:

- muscle damage within the compartment
- raised pressure within the compartment
- neurovascular damage within the compartment
-

Compartment syndrome is commonly seen following:

- tibial fracture
- elbow fracture
- femur fracture
- proximal humerus fracture

Common symptoms of compartment syndrome are:

- tingling sensation distally
- pain out of proportion to injury
- inability to move the toes / fingers
- toes / fingers becoming pale

Important signs to observe for compartment syndrome include:

- pain on passive stretch of the muscle involved in the compartment
- swelling of leg / forearm
- tense compartment
- muscle weakness distally
- sensory loss distally
- capillary filling > 2 sec

Immediate response after suspecting compartment syndrome, should be

- Limb elevation
- Opioid analgesics
- Call SHO / Call Registrar if SHO not available
- Split POP down to skin and keep the plaster on
- Remove the plaster

Complications/consequences of compartment syndrome are:

- Permanent distal muscle weakness
- Permanent distal sensory loss
- Limb loss

Figure 1 RCN GUIDELINES [3]



Figure 2 BOA GUIDELINES [4]



BRITISH ORTHOPAEDIC ASSOCIATION
STANDARDS FOR TRAUMA (BOAST) ©



BOAST 10: DIAGNOSIS AND MANAGEMENT OF COMPARTMENT SYNDROME OF THE LIMBS



Background and Justification Acute compartment syndrome of a limb is due to raised pressure within a closed fascial compartment causing local tissue ischaemia and hypoxia. In clinical practice, it is most often seen after tibial and forearm fractures, high-energy wrist fractures and crush injuries. Other important causes include restrictive dressings or casts, prolonged immobilization and reperfusion of ischaemic limbs. Early diagnosis and treatment is vital to avoid severe disability. Pulses are normally present in compartment syndrome. Absent pulses are usually due to systemic hypotension, arterial occlusion or vascular injury.

Inclusion Patients of all ages.

Standards for practice audit:

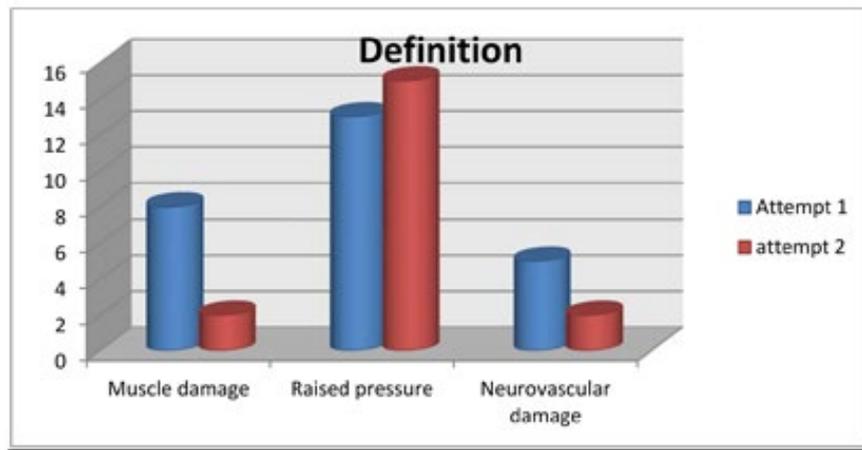
1. Assessment for compartment syndrome should be part of the routine evaluation of patients who present with significant limb injuries, after surgery for limb injuries, and after any prolonged surgical procedure which may result in hypoperfusion of a limb.
2. Case documentation should include: the time and mechanism of injury, time of evaluation, level of pain, level of consciousness

Results

All the participants were on duty when the questionnaire was distributed at initial audit and then re audit 3 months later; therefore the response rate was 100% on both occasions. 17 participants completed the initial questionnaire and 14 completed the re audit.

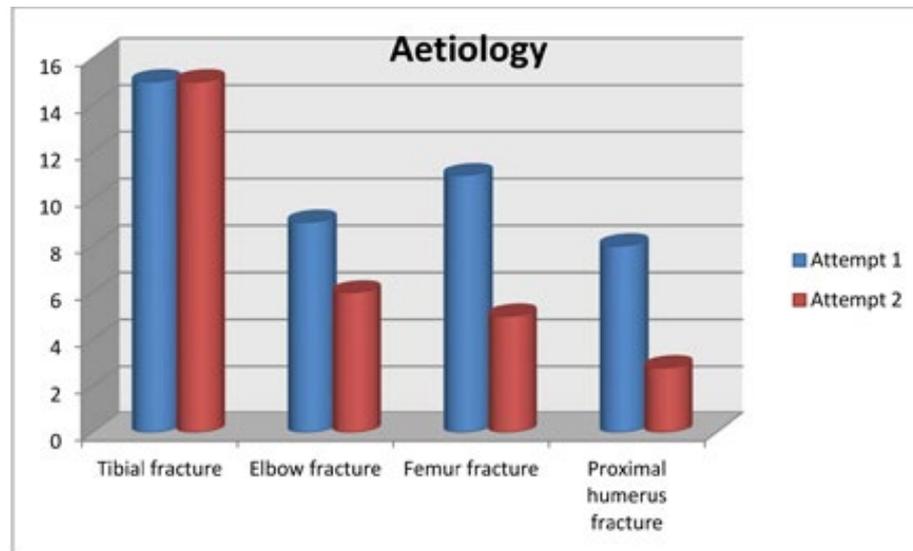
The majority of staff at the first audit was able to identify some obvious answers but it was apparent that they lacked understanding of compartment syndrome, awareness was limited and the knowledge was basic - there was a shortfall in understanding and assessing compartment syndrome. Using the results it was found that compartment syndrome is poorly understood and its awareness suboptimal. Specific answers were not recognised and there was a tendency to choose all the answers when completing the questions. This may indicate that the questionnaire was not set out clearly, with a suggestion that there could be one or more answer for each question and that the staff did not want to risk missing out a vital answer. However as you can see from the graphs shown (Figures 3-8) it does indicate at re audit, that there has been an increase of knowledge and an increase in confidence in answering the questions, as the answers are more specific and correct, although we have to consider that there were 3 less staff who completed the questionnaire in the re audit.

Figure 3



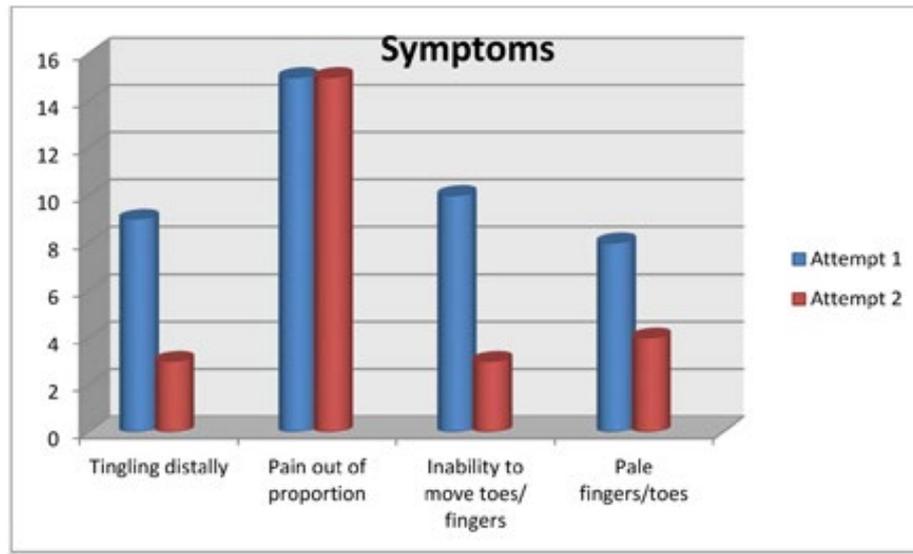
Definition Answer:- Raised pressure within the compartment.

Figure 4



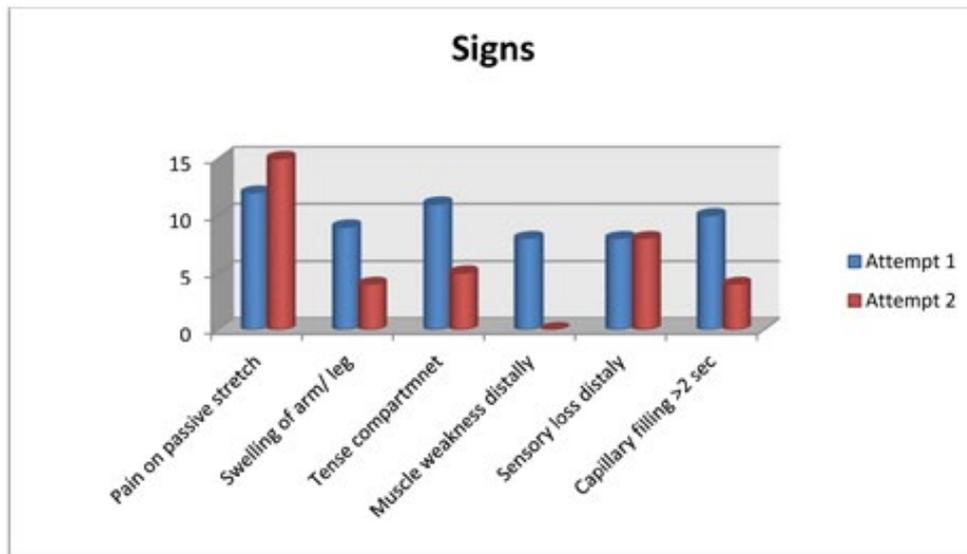
Aetiology answer:- Tibial fracture

Figure 5



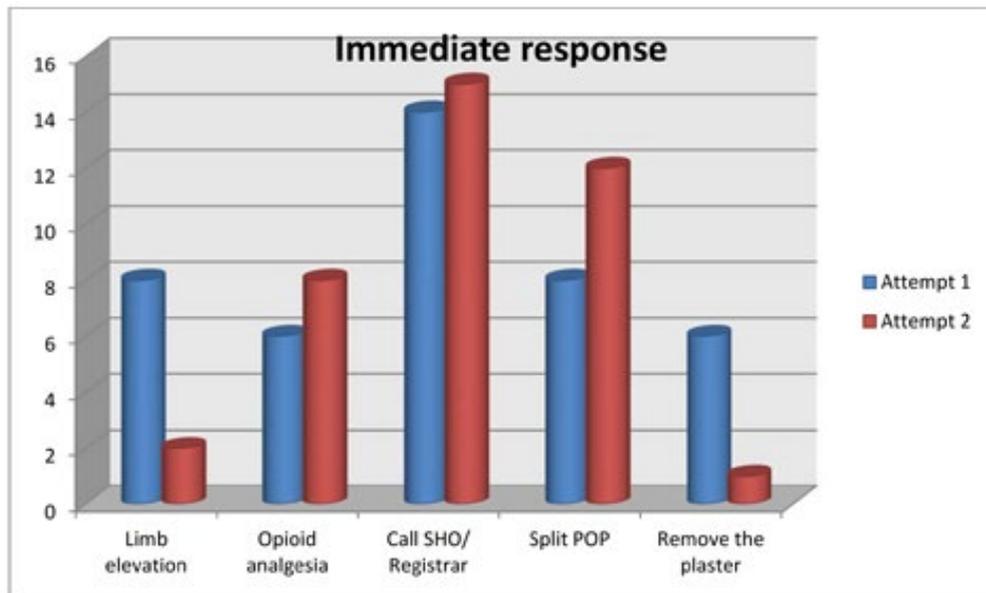
Symptom answer:-Pain out of proportion to injury

Figure 6



Signs actual answer:- Pain on passive stretch of the muscle involved in the compartment

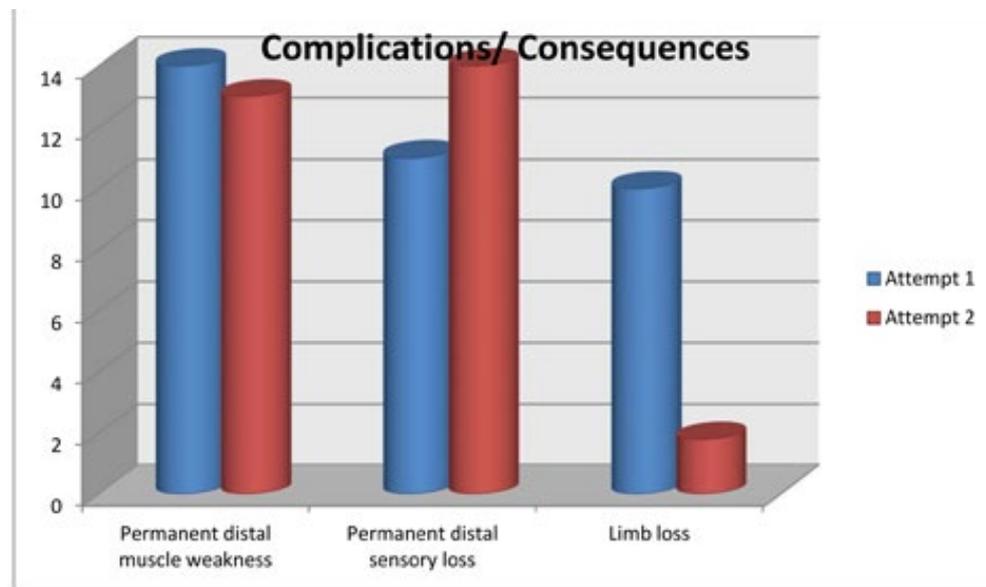
Figure 7



Immediate Response actual answer:-

- Split POP down to skin and keep the plaster on
- Remove the Plaster
- Call SHO/ Call registrar

Figure 8



Complications/ consequences answer:-

- Permanent distal muscle weakness
- Permanent distal sensory loss

Discussion

As stated compartment syndrome is a surgical emergency and early recognition is emphasised. Severe limb injury and long duration of surgery are two of the most common causes of compartment syndrome. Decreased awareness can lead to delaying the diagnosis and therefore critical decision making. Day surgery nurses need to understand the fact that it is a potentially life threatening condition and predicting and managing acute compartment syndrome is important to improve health outcomes. As they are very often the first port of call in emergency situations, suspicion of raised compartmental pressure, early recognition, and promptness in notifying the on call doctor is of vital importance if limb function is to be preserved and complications are to be avoided.

This audit identified gaps in the knowledge and awareness of the Day Surgery nurses, which was highlighted in the first audit, also and the need for support through policies and evidence based practice guidelines to improve the inadequate and suboptimal knowledge about the condition.

The audit was imperative to assess the knowledge of the nurses, due to the introduction of the Day Case Trauma Pathway, it was essential that we gave them as much guidance when dealing with Compartment syndrome, as early recognition is vital if the patient is to make a full recovery from this condition.

Nursing is a dynamic, evolving profession and all staff is accountable to safe and effective patient care. With annual PADRs and revalidation, the standard of practice has to be maintained with a more proactive approach. One strategy was to provide existing guidelines from RCN [3] and BOA[4] (Figure 2).

At re-audit there was notable improvement that was identified, which is encouraging, it shows that the Nurses within the day Surgery Unit are motivated in wanting to learn new skills and are able to adapt to new services when introduced within the department. The audit encouraged healthy debates amongst the staff, which has lead to their increased knowledge in this area and certainly has raised their awareness when patients are admitted via the Trauma pathway, which was the intention of this study.

Conclusion

Day surgery nurses knowledge of compartment syndrome was suboptimal as they rarely had to care for Trauma patients. Given the introduction of the Trauma Pathway it is now essential that they are aware of this potential life threatening condition and more importantly are confident in treating and knowing how to act if it is suspected.

With the introduction of the poster, flowchart, guidelines and the lecture has improved the knowledge of the Nurses in Day Surgery and they feel confident and competent in looking for the signs and symptoms. Compartment Syndrome is always at the fore of their minds when caring for all Trauma patients and the nurses are thinking about this potential complication. We have now introduced regular education and training to all the staff nurses, which are given by senior members of the Day Surgery team and we have also developed a close working relationship with the Trauma Pathway Coordinator.

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