

A Study on follow-up assessment on patients undergoing a plaster slab application at Mosta health centre

Abstract

Patients presenting with traumatic injuries at Mosta Health Centre (MHC) undergo radiological assessments to identify fractures or bone pathologies. Those with suspected fractures are treated with plaster slabs and referred for follow-up at the Fresh Trauma Clinic (FTC) at Mater Dei Hospital (MDH) for further monitoring. However, patient compliance with FTC appointments remains uncertain, raising concerns about continuity of care and potential complications from missed visits. This retrospective cohort study aims to evaluate whether patients attended their FTC follow-up appointments and whether fractures were confirmed. Data from plaster slab requisition forms at MHC over six months were compared with MDH's CPACS database to assess diagnoses and follow-up referrals. Data were securely stored and deleted after study completion.

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Introduction

Every day, numerous patients present to the Mosta Health Centre (MHC) after experiencing traumatic injuries. Such patients are subject to radiological investigations (X-rays) to identify any underlying fractures or other bone-related pathologies that might not be immediately evident through physical examination alone. When a fracture is suspected or confirmed, a plaster slab is applied, and the patient receives advice on proper plaster slab care. A follow-up appointment is then scheduled at the Fresh Trauma Clinic (FTC) following consultation with the on-call orthopaedic surgeon at Mater Dei Hospital, who ensures that the patient's care plan is aligned with the appropriate clinical pathway. The FTC follow-up is crucial for monitoring the patient's progress, reassessing the injury and determining whether further intervention, such as additional imaging, physical therapy, or even surgical procedures, is necessary. Despite the importance of these follow-up appointments, there remains a significant gap in knowledge regarding patient compliance. It is unclear whether patients consistently attend their scheduled FTC follow-up visits. This uncertainty raises concerns about the continuity of care, as missing these appointments could result in untreated complications, such as undetected fractures, improper healing, or the development of secondary conditions. Ensuring that patients follow through with their FTC visits is essential to achieving positive outcomes and preventing long-term issues that could adversely affect their quality of life.

Aim

To audit whether such patients proceeded with their follow-up at FTC and whether a fracture was detected.

Methodology

A retrospective cohort study was conducted using the plaster slab requisition forms from the Mosta Health Centre to evaluate suspected fractures and types of slabs applied over a six-month period. The results were securely stored on the hospital intranet network and will only be accessible to an authorized individual for data collection, with all data to be deleted upon completion of the study. This information

was then compared to the CPACS database at Mater Dei Hospital (MDH) to determine the radiologist's diagnosis and whether the patient was referred for follow-up at the FTC.

The following data were collected, which will be used to assess the appropriateness of Plaster Slab application and FTC follow-up:

- Side of fracture
- Fracture documented on the plaster requisition form
- Type of slab applied at the Mosta Health Centre
- CPACS note indicating pathology
- Whether a repeat X-ray was performed on the day of initial visit
- Whether an FTC was given, and if so
- Whether a slab was present at the FTC
- Whether further imaging was requested
- Whether the patient proceeded with surgical intervention

Main outcomes and measures

To assess whether patients proceeded with their FTC follow-up.

Results

A total of 456 patients were reviewed at the Mosta Health centre over a six-month period, all of whom had a plaster slab applied on the day of their visit. The patients ranged in age from 6 to 93 years. Of these, 241 (52%) were female and 215 (48%) were male. According to the plaster requisition forms, 181 (40%) patients had a plaster slab applied to the lower limbs, with all receiving a below-knee back slab. Meanwhile, 275 patients (60%) had a plaster applied to the upper limbs: 111 (24%) had a below-elbow dorsal/volar slab, 72 (16%) had a below-elbow dorsal slab, 2 had a below-elbow volar slab, and 90 (20%) had a scaphoid slab. However, 12 patients (3%) listed as having a below-knee back slab actually received a below-elbow dorsal/volar slab, and 1 patient (0.2%) listed as having a below-elbow dorsal/volar slab received a below-knee back slab.

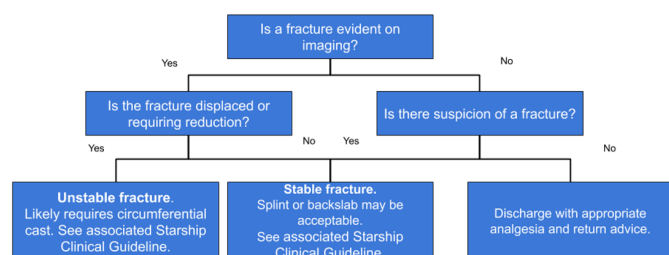
A total of 48 patients (11%) patient had incorrect or indecipherable ID numbers listed on their requisition forms, preventing an assessment of whether they received follow-up care after their MHC visit. Of the 456 patients, 280 (61%) were given an FTC follow-up, with appointments ranging from 1 to 8 weeks. However, 128 patients (28%) did not receive an FTC follow-up. Among these, 82 patients (18%) had a fracture documented on CPACS, while 119 patients (26%) had no fracture recorded. At their FTC follow-up, 141 patients (31%) still had their plaster slab in place, whereas 136 (30%) did not. One patient (0.12%) had their FTC follow-up performed in their home country. Additionally, 16 patients (4%) underwent surgical procedures, and 32 patients (7%) required further radiological investigations.

Discussion

Plaster casts are commonly used in cases of suspected or confirmed fractures to immobilize the affected limb and ensure proper alignment during the healing process. The application of a plaster cast requires careful consideration of several key factors to optimize the outcome and patient comfort. These factors include:

- The type of cast and the duration it will need to remain in place, which depend on the nature and severity of the fracture.
- The positioning of the limb, particularly if it is deviated from a neutral position, to promote optimal healing and prevent complications.
- Minimizing the immobilization of surrounding joints, aiming to limit restriction to as few joints as possible while still providing adequate support to the injured area.

To further ensure that plaster casting is used appropriately and effectively, guidelines have been established by the Orthopaedic Clinical Education Resource Hub. These guidelines are designed to help healthcare providers select the most suitable immobilization method for each specific injury, whether it involves a plaster cast or an alternative device. By adhering to these recommendations, clinicians can provide more individualized care, promoting better outcomes for patients with fractures and other orthopaedic conditions.



¹Starship – Guideline on Acute Orthopaedic Plaster Casting

The process of plaster cast application can be effectively organized into a three-phase¹ approach: inspect, ask, and feel. This method ensures a thorough and systematic application while prioritizing patient safety and comfort.

Phase 1: Inspect

The first step involves a detailed assessment of the patient's condition and the relevant x-ray results. During this phase, the appropriate cast type is selected based on the fracture or injury, and the positioning of the limb is carefully considered to ensure proper alignment. The clinician also checks for any potential damage to the cast and evaluates the mobility and coloration of the patient's digits to ensure there is no impairment to circulation or nerve function.

Phase 2: Ask

The second phase is patient-centred, focusing on communication and understanding. Here, the patient is asked if they are experiencing any pain or discomfort, and their feedback is taken into account. The clinician ensures that the patient fully understands the discharge instructions and has the opportunity to ask any questions or raise concerns. This step is crucial in empowering the patient to take an active role in their own care and to be aware of the signs and symptoms that require immediate attention.

Phase 3: Feel

In the final phase, the clinician reassesses the limb to check for warm peripheries, evaluates sensation, and performs a capillary refill test to confirm adequate circulation. The cast is then physically examined for any irregularities, such as sharp edges or areas of excessive tightness, which could lead to complications like skin irritation or pressure sores.

After the plaster cast is applied, it must undergo a final inspection before the patient is discharged from the health centre. This step ensures that the cast is correctly positioned, providing the necessary immobilization while allowing the patient some degree of range of motion to prevent conditions like compartment syndrome. If any issues are identified, they should be promptly escalated to the supervising clinician, who may consider reapplying the cast if necessary.

Once the cast is properly applied and assessed, the patient is provided with detailed instructions on how to care for it at home. These care guidelines are critical for preventing complications and ensuring the best possible outcome. Patients are advised to:

- i. Keep the cast dry at all times.
- ii. Avoid inserting any objects underneath the cast.
- iii. Refrain from scratching or damaging the cast.
- iv. Return to the nearest health centre or emergency department if they experience uncontrolled pain, increasing tightness or swelling, discoloration, or cold extremities.

Plaster casts are designed not only to immobilize the affected limb but also to facilitate recovery by improving the joint's range of motion. This is achieved through a method known as serial casting,² which involves the application of casts that provide prolonged, passive, low-load stretching to the surrounding soft tissues. Serial casting can be applied to both upper and lower limb injuries and allows patients to perform functional activities while promoting healing.

Follow-up with an orthopaedic physician is a critical component of the treatment plan for patients with suspected or confirmed fractures. For patients in whom a fracture was initially suspected but not confirmed, repeat imaging may provide clarity on whether a fracture is present. For those with a confirmed fracture,³ the physician will assess the healing process. Patients showing signs of adequate healing can proceed with rehabilitation, while those who are not healing as expected may require additional imaging or consideration for surgical intervention.

In addition to orthopaedic follow-up, patients who have suffered a suspected or confirmed osteoporotic fracture⁴ should also receive medical follow-up. Osteoporosis, characterized by reduced bone mineral density and compromised bone quality, significantly increases the risk of fractures, often resulting from low-energy trauma. Patients who have sustained one fracture are at higher risk of experiencing subsequent⁵ fractures, particularly if the initial injury was due to osteoporosis.

Proper diagnosis and management of osteoporosis are essential to reduce the risk of future fractures and improve the patient's overall quality of life. Timely intervention can not only prevent further injury but also help patients regain mobility and independence, contributing to their long-term well-being.

Limitations

Several limitations were encountered during the course of this study, which impacted the accuracy and comprehensiveness of the findings. The first notable limitation was the study's design. A retrospective approach was utilized, relying on the analysis of pre-existing data and convenience sampling. This methodology inherently limits the study to the quality and completeness of the available records, introducing potential biases and gaps in the data.

One of the primary challenges faced was the incorrect or illegible documentation of patient identification numbers on the plaster slab requisition forms. In cases where the patient's ID was inaccurately recorded or indecipherable, it became impossible to track their subsequent medical care and outcomes after their visit to the Mosta Health Centre (MHC). This documentation issue led to incomplete follow-up data and restricted the study's ability to assess patient progress comprehensively.

Other documentation errors were also prevalent on the requisition forms. In several instances, the side of the body to which the plaster slab was applied (left or right) was not specified, and in some cases, the wrong type of slab was recorded. For example, a dorsal slab might have been listed when a back slab was applied, or the form failed to indicate whether a dorsal or volar slab was used for an upper limb injury. These inconsistencies created difficulties in accurately categorizing and analysing the treatment administered.

Another significant limitation was the lack of documentation regarding the provisional Fresh Trauma Clinic (FTC) appointment date on the requisition forms. This omission complicated efforts to determine whether patients had been properly scheduled for follow-up care. Additionally, limited access to FTC documentation meant that the study had to rely on indirect methods, such as reviewing CPACS records to see if a repeat X-ray had been ordered. This workaround was necessary to infer whether patients were seen by orthopaedic specialists, but it introduced uncertainty and limited the study's ability to confirm follow-up care definitively.

Moreover, the potential for misdiagnosis in the pathology documented on CPACS represents another limitation. Factors such as poor image quality, incorrect orientation during imaging, or human error in interpretation could lead to inaccurate diagnoses. This, in turn, could affect the reliability of the data used in the study, as the true nature of some fractures or pathologies might have been missed or incorrectly identified.

Overall, while the study yielded valuable insights, these limitations highlight the importance of accurate and thorough documentation, as well as the need for more robust data collection methods in future research. Addressing these issues would enhance the quality of follow-up care assessments and improve the reliability of similar studies.

Conclusions and relevance

The application of plaster casts plays a crucial role in the optimal protection and alignment of stable fractures as the bone heals. Plaster casts are typically applied in cases of suspected bone fractures or after a closed reduction procedure, serving to immobilize the affected

limb and stabilize the fracture site to facilitate proper healing. At the Mosta Health Centre, many patients present with suspected fractures for initial management. However, a significant gap exists in tracking whether these patients are receiving adequate follow-up care. This lack of follow-up has the potential to undermine the effectiveness of initial treatment and negatively impact patient outcomes. Several key shortcomings highlight the consequences of inadequate follow-up care:

- i. Failure to Attend FTC Follow-Up: Patients who do not attend their scheduled Fresh Trauma Clinic (FTC) appointments risk either:
 - a. Receiving unnecessary treatment for a bone that is not fractured, leading to prolonged immobilization and potential complications, or
 - b. Failing to detect a pathological fracture that was missed in the initial assessment, which could result in delayed or improper treatment.
- ii. Inadequate Post-Fracture Care and Rehabilitation: Effective recovery from a fracture requires proper post-treatment care and rehabilitation. Without consistent follow-up, patients may miss out on crucial interventions that support healing, restore function, and prevent complications such as stiffness, weakness, or deformity.
- iii. Lack of Continuity of Care for Secondary Fractures: Patients who suffer from a secondary fracture, particularly those with underlying conditions like osteoporosis, may not receive timely and appropriate follow-up care. This lack of continuity in managing secondary fractures can exacerbate the patient's condition and increase the risk of further injury.
- iv. Absence of Local Secondary Fracture Prevention Services: The absence of preventive services at the local level contributes to the risk of recurrent fractures, particularly in high-risk populations such as older adults or those with low bone density. Preventive services, including screening and treatment for osteoporosis, could play a pivotal role in reducing the likelihood of future fractures.

The lack of Fresh Trauma Clinic follow-ups at the Mosta Health Centre heightens the risk of these shortcomings materializing, potentially leading to a decline in the patient's overall quality of life. This is especially concerning for frail patients and those over the age of 50, who are at increased risk of sustaining secondary fractures. For these patients, follow-up care is not only essential for addressing the immediate fracture but also for managing underlying conditions, such as osteoporosis, that contribute to their fragility.

Establishing a dedicated Fresh Trauma Clinic and Secondary Fracture Prevention Service within the Mosta Health Centre could significantly enhance the diagnosis and treatment of orthopaedic conditions. Such services would ensure that patients receive timely follow-up care, reducing the risk of undiagnosed fractures and promoting optimal recovery. In high-risk patients, particularly those with osteoporosis, these services could also play a critical role in preventing new fractures through early intervention, appropriate medical management, and targeted rehabilitation programs. By addressing both the orthopaedic and medical needs of patients, these services would not only improve outcomes but also help maintain or even enhance the patient's overall quality of life.

Acknowledgments

None.

Conflicts of interest

The authors declare that there are no conflicts of interest.

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