

Omitted knee joint injuries in the polytraumatized patient. Systematic review of the literature

Esteban Castro Contreras M.D.

Jalisco, Mexico

Original Article

Trauma Surgery



Background: Knee injuries can go unnoticed in multiple trauma patients, leading to potential long-term complications.

Aim: To identify the incidence of missed knee joint injuries in polytraumatized patients, through a systematic literature review.

Methods: A systematic literature search was conducted in PubMed using the PRISMA criteria and the following terms: knee Injuries AND (missed OR overlooked OR unadvertised OR forgotten) AND (polytrauma OR trauma).

Results: The initial search yielded 144 studies, of which 6 relevant articles that met the predetermined inclusion criteria were selected. In the total number of patients included (n=140,257) the overall incidence of injuries was 2.6%. The knee injuries found were single or multiple injuries to knee ligaments, especially the lateral ligament and the medial collateral ligament, knee dislocation, tibiofibular dislocation and knee instability.

Conclusion: Unnoticed or missed knee injuries are not rare and should be sought in a thorough evaluation because failure to identify them can contribute to cosmetic and functional problems and deterioration in quality of life. Therefore, continuous clinical and radiological surveillance is recommended.

Keywords. Injuries, knee, omitted, overlooked, incidence, polytrauma.

In the medical field, comprehensive care of the polytraumatized patient is a complex challenge that demands a thorough evaluation of all potential injuries. However, among the many concerns that can arise, knee joint injuries are often initially overlooked. The knee, being a crucial joint for mobility and stability, plays a fundamental role in the overall functionality of the body. Knee joint injuries, when omitted in the polytraumatized patient, can have significant long-term consequences, affecting not only the individual's quality of life, but also the general prognosis of their recovery.

This omission may arise from the urgency to address more obvious or life-threatening injuries, relegating knee joint injuries to the background. However, it is imperative to recognize the importance of a thorough evaluation of the knee in the context of the polytraumatized patient, since joint injuries, although less obvious at first glance, can have serious implications on long-term functionality. This topic aims to explore the relevance of properly identifying and addressing knee joint injuries in polytraumatized patients, highlighting the need for comprehensive care that does not leave aside any manifestation of damage in this crucial joint.

In this study, a literature review is presented on the type and frequency of missed knee joint injuries in polytraumatized patients.

Methods

Article inclusion criteria

In PubMed, we searched for original articles on the incidence of Omitted knee joint injuries in the polytraumatized patient.

Search strategy and information sources

A search was performed in PubMed with the following MESH terms, without limits on language, publication period, or type of study:

knee Injuries AND (missed OR overlooked OR unadvertised OR forgotten) AND (polytrauma OR trauma), ("knee"[MeSH Terms] OR "knee"[All Fields] OR "knee joint"[MeSH Terms] OR ("knee"[All Fields] AND "joint"[All Fields]) OR "knee joint"[All Fields]) AND ("injury"[All Fields] OR "injuries"[All Fields] OR "injury "[All Fields] OR "injuries"[All Fields]) AND ("missed"[All Fields] OR "misses "[All Fields] OR "missing"[All Fields] OR "missings "[All Fields] OR ("overlook"[All Fields] OR "overlooked"[All Fields] OR "overlooking"[All Fields] OR "overlooks" [All Fields]) OR "unadvertised"[All Fields] OR "forgotten"[All Fields]) AND ("multiple trauma"[MeSH Terms] OR ("multiple"[All Fields] AND "trauma"[All Fields]) OR "multiple trauma"[All Fields] OR "polytrauma"[All Fields] OR "polytraumas"[All Fields] OR ("injuries"[MeSH Subheading] OR "injuries"[All

From the Department of Joint Surgery at Terranova Hospital, Jalisco, México. Received on March 11, 2024. Accepted on March 21, 2024. Published on March 24, 2024.

Table 1. Synopsis on the incidence of missed knee joint injuries in polytraumatized patients.

Author, year	Number of participants	Type of injury	Incidence of injury
Weber, 2020	139,462	ligament injury	3.2%
		Dislocation	0.8%
Darabos, 2013	275	Dislocation	4%
Chan, 1980	327	Tibiofibular dislocation Damage to the lateral ligament	0.3%
			0.6%
Kremlin, 1996	51	Damage to the medial collateral ligament	3.9%
Tammelin, 2016	121	Multi-ligamentous knee injury	0.8%
Roessle, 2013	twenty-one	knee instability	9.5%

Fields] OR "trauma"[All Fields] OR "wounds and injuries"[MeSH Terms] OR ("wounds"[All Fields] AND "injuries"[All Fields]) OR "wounds and injuries"[All Fields] OR "traumas"[All Fields] OR "traumas "[All Fields]))Translations knee: "knee"[MeSH Terms] OR "knee"[All Fields] OR "knee joint"[MeSH Terms] OR ("knee"[All Fields] AND "joint"[All Fields]) OR "knee joint"[All Fields Injuries: "lesion"[All Fields] OR "lesion's"[All Fields] OR " lesions "[All Fields] OR "lesions"[All Fields] missed: "missed"[All Fields] OR "misses"[All Fields] OR "missing"[All Fields] OR "missings "[All Fields] overlooked: "overlook"[All Fields] OR "overlooked"[All Fields] OR "overlooking"[All Fields] OR "overlooks"[All Fields] polytrauma: "multiple trauma"[MeSH Terms] OR ("multiple"[All Fields] AND "trauma"[All Fields]) OR "multiple trauma"[All Fields] OR "polytrauma"[All Fields] OR "polytraumas"[All Fields trauma: "injuries"[Subheading] OR "injuries"[All Fields] OR "trauma"[All Fields] OR "wounds and injuries"[MeSH Terms] OR ("wounds"[All Fields] AND "injuries"[All Fields]) OR "wounds and injuries"[All Fields] OR "trauma's"[All Fields] OR "traumas"[All Fields]

Relevant publications were hand searched for additional relevant studies.

Study selection and data extraction

In this study, PRISMA criteria for systematic reviews were used, including the identification of relevant records, the selection or screening of these, the eligibility of those that meet selection criteria and contain the required information, as well as the total number of studies finally included.

All abstracts found on the topic of interest were evaluated by two independent reviewers, and in case of differences in selection, a third researcher resolved the disagreement individually, independently

and blindly. Studies that met the inclusion criteria were reviewed in their entirety to identify those studies that provided the required information.

The following information was extracted from the publications: authors, year, total number of patients included, type of knee injuries identified, frequency of knee injuries.

The total number of patients included in the studies, and the mean incidence of total injuries, were estimated.

Discussion

Time delay in recognition of overlooked musculoskeletal injuries

According to a study by Born et al. The delay time in the recognition of musculoskeletal and joint injuries ranges between 1 and 91 days (40). We did not find other studies that reported the time between multiple trauma and the recognition of unnoticed injuries.

Synopsis of the studies found

Next, we present the studies in which missed knee joint injuries have been reported in polytraumatized patients.

Weber et al. studied ligament injuries and knee dislocations in patients with severe trauma, being rare but complex events associated with high-energy trauma. The DGU Trauma Registry was used and 4,411 patients with ligament injuries and 1,153 with knee dislocation were identified. A significant increase in the risk of concomitant neurovascular injuries was observed in dislocated knees compared to controls. Specific risk factors, such as injury mechanisms (pedestrian hit, motorcycle, motor vehicle accidents) and associated skeletal injuries (patella, tibia, femur), were identified as predictors of knee injuries, while

Table 2. Summary of total participants and average incidence of injuries.

	No. Participants	Average incidence of knee joint injuries
Total	140,257	2.6%

overall injury severity or gender They weren't. Despite a comparable severity rate, knee injuries were associated with prolonged hospital stay, highlighting the importance of a comprehensive clinical evaluation to prevent late or missed diagnoses of these injuries. (41)

While, Darabos et al. evaluated the incidence and outcomes of knee dislocation in multiple trauma patients treated in a medical institution. Of the 275 polytrauma patients treated between January 2005 and February 2011, knee dislocation was found to be present in 14 patients (4%). Treatment included initial management according to ATLS guidelines, neurovascular evaluation, concurrent emergency surgical care with resuscitative procedures, and ICU hospitalization. A one- to three-stage surgical treatment protocol was applied, based on the evaluation of systemic and local clinical status, classification of injuries, and consequences of associated injuries. Clinical outcomes were better in patients treated surgically in one or two stages, compared to those who followed the three-stage protocol, although the difference was not statistically significant. The conclusion highlights that the physiological status of the patient and the type of knee injury should guide the choice of the timing and type of treatment, suggesting that single-stage treatment should be the first option, while three-stage treatment should be avoided due to less favorable results.(42)

Chan et al. conducted a retrospective survey of 327 patients with multiple lesions to determine the incidence of undetected lesions and the reasons behind missed diagnoses. It was found that 12% of patients had at least one undiagnosed injury at the first examination, with motorcyclists being the most vulnerable group with an incidence of 23%. 0.3% of participants had tibiofibular dislocation and 0.6% had damage to the lateral ligament. Undetected lesions showed a tendency to concentrate in the major joints. Several factors were identified that predisposed to an inadequate initial evaluation, such as a poor clinical routine, incorrect interpretation of certain physical signs, inappropriate use of X-ray services and, especially, the admission of these patients to rooms not specialized in orthopedics.(43)

Kremli analyzed 80 musculoskeletal injuries in 51 patients at King Khalid University Hospital. The diagnostic failure rate was 0.6% of all injured patients seen in the emergency room and 6% of admissions under orthopedic care. The three most common sites of missed injuries were the knee (16 injuries), foot and ankle (14 injuries), and hip and pelvis (13 injuries).

Twenty-four (47%) initially presented with multiple injuries. 3.9% of patients presented damage to the medial collateral ligament. In 48 of these patients (60%) there were one or more complaints related to the missed injury. Factors responsible for inappropriate diagnosis included disruption of clinical routine, inadequate clinical examination, ignorance of the patient's complaints and positive physical signs, and missing or misinterpreted and inadequate radiographs. (44)

Tammelin et al. conducted a cohort study that evaluated trauma patients admitted to a trauma intensive care unit, investigating the frequency and consequences of injuries not detected by a non-formalized tertiary survey in the three months after the injury. During the study period, which spanned from January 1 to October 17, 2013, 841 lesions were identified in 115 patients. The vast majority (93%) were Type 0 lesions, detected before the tertiary survey, while only a small percentage corresponded to lesions missed by the tertiary survey (2.6% Type II). Although the majority of these missed injuries were fractures, only two of the 22 Type II injuries required surgical intervention. The rate of missed injuries was low and did not contribute significantly to morbidity, prolonged intensive care unit stay, or mortality. In general, undetected lesions in this context were mostly managed with no treatment. (45)

Roessle et al. conducted an observational study of trauma patients at a university hospital in São Paulo, conducted from February to May 2012, 182 patients underwent this evaluation, with 11.5% (21 patients) presenting unattended injuries, totaling 28 undetected injuries. Of these, 25% (seven lesions) required surgical treatment. Of note, two of the 21 patients with neglected injuries also showed knee instability. In conclusion, strategies involving tertiary assessment were shown to be beneficial, being a low-cost and easily applied method to identify missed injuries in trauma victims, regardless of the mechanism of injury.(46)

Table 1 presents a summary with the number of participants in each of the studies, the number of study participants, the type of injury and its incidence [Table 1]. The total number of studies found that reported knee joint injuries totaled 140,257 patients, among whom the overall incidence of injuries was 2.6% [Table 2].

Conclusions

The overall incidence of knee joint injuries was 2.6% and the type of injuries reported were: single

or multiple injuries to knee ligaments (especially lateral and medial collateral), knee dislocation, tibiofibular dislocation and knee instability.

Since delay in the identification of missed injuries contributes to long-term cosmetic and functional problems and impaired quality of life, continuous clinical and radiological surveillance is required in polytraumatized patients to detect occult injuries and identify injuries not identified in the evaluations. primary and secondary.

Conflicts of interest

There is no conflict of interests.

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Esteban Castro Contreras
Department of Joint Surgery
Terranova Hospital
Jalisco, Mexico