

Letter

Letter to the Editor: Missing Information and Bias Confounds Relationship Between Manipulation and Atypical Femur Fracture

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Dear Editor,

In the article entitled “*Femoral Shaft fracture Occurring as a Result of Physical Manipulation: A Case Report*” by Ayoubi et al. [1], the authors describe a case of femoral diaphyseal fracture purportedly from chiropractic manipulation. We would like to draw attention to significant inadequacies within this case report including misidentification of the fracture classification, missing clinical information, and potential misclassification of the treating provider. These errors present readers with a biased view of chiropractic care and joint manipulation.

Femur fractures in young populations typically occur from traumatic high-energy accidents such as motor vehicle collisions. In contrast, the patient described by Ayoubi et al. sustained an atypical femoral fracture (AFF). AFFs are stress or insufficiency fractures that develop over time and occur with minimal or no trauma in the subtrochanteric region or femoral shaft [2]. In 2013, the American Society for Bone and Mineral Research task force developed a revised case definition of AFF which requires a diaphyseal fracture location as well as 4 of 5 major features: (1) minimal or no trauma, (2) transverse fracture line, (3) complete fracture which may involve a medial spike, or incomplete fracture only involving the lateral cortex, (4) no or minimal comminution, and (5) local periosteal or endosteal thickening [2].

This patient satisfied 4 of the 5 major features (1–4) thus meeting the diagnostic requirements of an AFF [2]. Although the American Society for Bone and Mineral Research case definition also describes minor features for AFF diagnosis, these are not needed when major criteria are met. In addition, these cannot be commented on as the authors did not include details regarding symptoms prior to manipulation or information regarding follow-up and fracture healing.

Atypical femoral fractures are exceedingly rare in nongeriatric populations without predisposing factors. Ayoubi et al. describe a “healthy” 37-year-old male that had “visited a chiropractor after a 2-week history of low back pain and right sided radiculopathy” with reportedly no history of long-term medication use. The authors do not report if prodromal symptoms such as a history of dull aching groin pain or thigh pain preceded the fracture [2]. The authors did not provide social or family history, or mention short-term medications (such as corticosteroids, which are often used for lumbar radiculopathy), which could enable readers to determine if risk factors for AFF were present.

Anchoring on joint manipulation as the cause of this patient’s pathologic fracture, as the authors have done, provides incomplete and dubious clinical information, leaving us to speculate as to the fracture’s true etiology. For example, several factors could predispose a 37-year-old male to sustain an AFF from a low energy event, including select medications that may adversely affect bone material properties (e.g., bisphosphonates, denosumabs, statins, oral glucocorticoids, or proton pump inhibitors) [2–4], underlying comorbidities (e.g., cancer, rheumatoid arthritis, vitamin D deficiency) [2], genetic disorders (e.g., hypophosphatasia, osteogenesis imperfecta) [5], and increased BMI [4].

In addition to lacking clinical information, the authors did not perform the recommended diagnostic testing for patients with AFF such as testing bone mineral density, dietary calcium, and vitamin D status [2]. While the authors claim further testing was not obtained due to loss of follow-up, premature closure bias probably resulted in insufficient diagnostic reasoning and evaluation at the point of care.

As we have shown, it is nearly inconceivable that a manual thrust treatment would result in the presented fracture pattern in a healthy individual. To our collective knowledge, the physical maneuver described in this case as “forceful repetitive flexion and valgus maneuvering ... applied to the right lower limb” is not a recognized or standardized chiropractic maneuver. We request verification of the “chiropractic” provider’s credentials in this case. Regulation of Chiropractic as a profession was only recently passed into law in May 2020 by the Lebanese parliament [6]. As this case takes place in Lebanon, we do not trust that the treating provider was a duly licensed and trained chiropractor, but rather, may have been a layperson or other health care provider. Improper use of the terms “chiropractor,” “chiropractic,” or “chiropractic manipulation” has been documented in other peer-reviewed literature and has resulted in the biased over-reporting of chiropractic-related injuries [7].

Lastly, Ayoubi et al. allude to causal relationships between manipulation of the spine and serious adverse events throughout this report such as death, infarction of the brain stem, vertebral artery dissection, cerebrovascular events, disc herniations, spinal fractures, radiculopathies, myelopathies, major bone fracture dislocations, and disc disease [1], but failed to recognize large epidemiological studies and systematic reviews that have found no increased risk of an adverse event when comparing chiropractic care to standard medical care [8–10]. Not only is the author’s assertion that “Such complications [cerebrovascular accidents or major orthopedic fractures] are rare but definitely underreported” without merit, it is antithetical to the ethos of evidence-based practice.

In summary, the case report presented by Ayoubi et al. has significant limitations and biases that preclude the ability to determine that chiropractic manipulation was the cause of the AFF sustained by the 37-year-old male in this case report. We propose the imaging hallmarks of AFF, indicative of underlying bone weakness, and the possibility of an untrained treating provider as alternative explanations to the patient’s fracture. High-quality reporting of serious adverse events is crucial to improve understanding of all treatment interventions. However, this report has very limited certainty as the authors did not adequately investigate the patient and report in a way to support their proposed explanation. The inadequacies of this report could result in the deepening of unfounded professional biases and patient harm

through physicians inappropriately deterring chiropractic treatment for healthy patients. We hope future descriptions of adverse events will provide greater clinical detail to allow for confidence in the reporting, and we recommend these reports include at least 1 clinician trained in the discussed intervention to reduce confirmation bias.

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Author Contributions

J.M. wrote the initial manuscript draft, which was added to by R.T., C.D., and P.B. with further insights. P.B. performed interpretation of the radiographs in the referenced case report. All the authors contributed to, critically revised, and approved of the final manuscript.

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