

Weber-B lateral malleolus fracture: an imaging case review

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A 69-year-old male presented to a chiropractic clinic four days post-injury with lateral ankle pain and swelling. Using the Ottawa ankle rules as a guideline for the need for radiographs, this case was deemed necessary for x-ray evaluation. The radiographic examination demonstrated a Weber B fracture of the distal fibula with a noted widening of the medial clear space of the ankle, which indicated the additional lesion of the deltoid ligament. This patient was referred to an orthopedist to have an open reduction and internal fixation (ORIF) surgery.

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KEY WORDS: fracture, fibula, Ottawa ankle rules, Weber classification, diagnostic imaging

Fracture du malléole latérale de Weber-B: un examen de cas par imagerie

Une personne de sexe masculin, âgée de 69 ans s'est présentée à une clinique chiropratique quatre jours après une blessure avec douleur et enflure à la cheville latérale. En utilisant les règles de la cheville d'Ottawa comme guide pour déterminer la nécessité de radiographies, il a été jugé nécessaire que ce cas subisse une évaluation par rayons X. L'examen radiographique a démontré une fracture de type Weber B de la fibula distale avec un élargissement noté de l'espace clair médial de la cheville, ce qui indiquait une lésion supplémentaire du ligament deltoïde. Ce patient a été référé à un orthopédiste afin de subir une chirurgie de réduction ouverte et de fixation interne (ROFI).

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MOTS CLÉS : fracture, fibula, règles d'Ottawa pour la cheville, classification de Weber, imagerie diagnostique

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Figure 1.

Clinical images taken two days post-injury. There is moderate soft tissue swelling of the left ankle that extends into the toes. There is also bruising at the lateral aspect of the foot and the area around the metatarsophalangeal joints.

Case Presentation

A 69-year-old male presented to a chiropractic clinic four days post-injury with a swollen and bruised left ankle (Figure 1) after an inversion injury while playing hockey. He experienced immediate lateral ankle pain, worsening with twisting movements, and was unable to weight-bear, using a makeshift cane for support. Radiographic studies revealed a fracture of the lateral malleolus at the level of the tibial plafond, classified as Weber B (Figure 2), and was subsequently referred to an orthopedic surgeon.

Gravity stress views were performed at the orthopedist's office, which demonstrated widening of the medial clear space denoting additional deltoid ligament instability (Figure 3). Subsequent Open-Reduction and Internal-Fixation (ORIF) surgery was completed one week later without complications, and follow-up imaging one-

week post-surgery confirmed the procedure's success (Figure 4). The patient was instructed to wear a walking boot and use a knee scooter for six weeks to maintain a non-weight-bearing status. Additionally, he was advised to follow a six-week post-operative treatment plan with a physiotherapist, including stretching and strengthening exercises. Twelve weeks following the surgery, the patient was back to full function with no pain and was able to return to playing hockey.

Discussion

Ottawa Ankle Rules

The Ottawa ankle rules (OAR) guide the decision for radiographic imaging after acute trauma, aiming to reduce unnecessary x-rays. Validated in adults with 99% sensitivity, these rules can decrease radiograph costs by 19-38%.¹ The rules include five components:²



Figure 2.

AP, Lateral, and Medial Oblique left ankle radiographs taken four days post-injury revealed a spiral, non-comminuted, distal fibular fracture, which extends to the level of the tibial plafond. Slight lateral translation was noted without evidence of angulation, rotation, or distraction. Concomitant soft tissue swelling about the ankle.

1. Bony tenderness along the distal 6 cm of the posterior fibula or tip of the lateral malleolus.
2. Bony tenderness along the distal 6 cm of the posterior tibia or tip of the medial malleolus.
3. Bony tenderness at the base of the 5th metatarsal.
4. Bony tenderness at the navicular.
5. Inability to weight bear immediately after injury and for four consecutive steps during the initial evaluation.

Components are categorized by injury type: rules 1, 2, and 5 pertain to ankle injuries, while rules 3, 4, and 5 apply to foot injuries. For ankle fractures, if there is pain in the malleolar zone with the addition of any of rules 1, 2 or 5, a radiograph is warranted. In the present case, the patient experienced pain along the distal 6 cm of the pos-

terior fibula and was unable to weight-bear immediately after the injury and for four consecutive steps during the initial evaluation.

Ankle Stress Views

X-rays have been found to be the most cost effective and readily available method of imaging that yields an accurate diagnosis (Table 1).³⁻⁵ Ankle stress views are recommended when initial imaging does not show clear signs of instability. Three methods exist: manual, gravity, and weight-bearing.⁶ The gravity stress view involves positioning the patient side-lying with the affected side down, applying a lateral force across the joint while the foot is in natural plantar flexion. This method is as reliable as manual tests⁷ and less painful⁸, as confirmed by the patient, who found this position to be comfortable and pain free.



Figure 3.
AP gravity stress view of the left ankle revealed a 2 mm lateral translation of the distal segment of the fibula. Increased clear space at the medial aspect of the ankle was evident, which denoted deltoid ligament instability.

Table 1.
Comparison of advantages and disadvantages of X-ray^{3,5}, CT³, MRI⁴, and Ultrasound⁵ for the evaluation of ankle injuries.

Imaging Modality	Advantages	Disadvantages
X-ray	<ul style="list-style-type: none">• Widely available, inexpensive, quick.• Effective for fractures and joint alignment.	<ul style="list-style-type: none">• Limited for soft tissue injuries.• Misses subtle syndesmotic damage.
CT	<ul style="list-style-type: none">• Detailed bone visualization.• Useful for subtle fractures and 3D surgical planning.	<ul style="list-style-type: none">• Limited for soft tissue injuries.• Higher radiation exposure.
MRI	<ul style="list-style-type: none">• Excellent for soft tissue assessment (ligaments, cartilage).• Identifies occult fractures.	<ul style="list-style-type: none">• Time-consuming• Limited availability.
Ultrasound	<ul style="list-style-type: none">• Non-invasive and portable.• Dynamic assessment of syndesmosis and ligaments.	<ul style="list-style-type: none">• Operator-dependent.• Limited for deep or complex fractures.

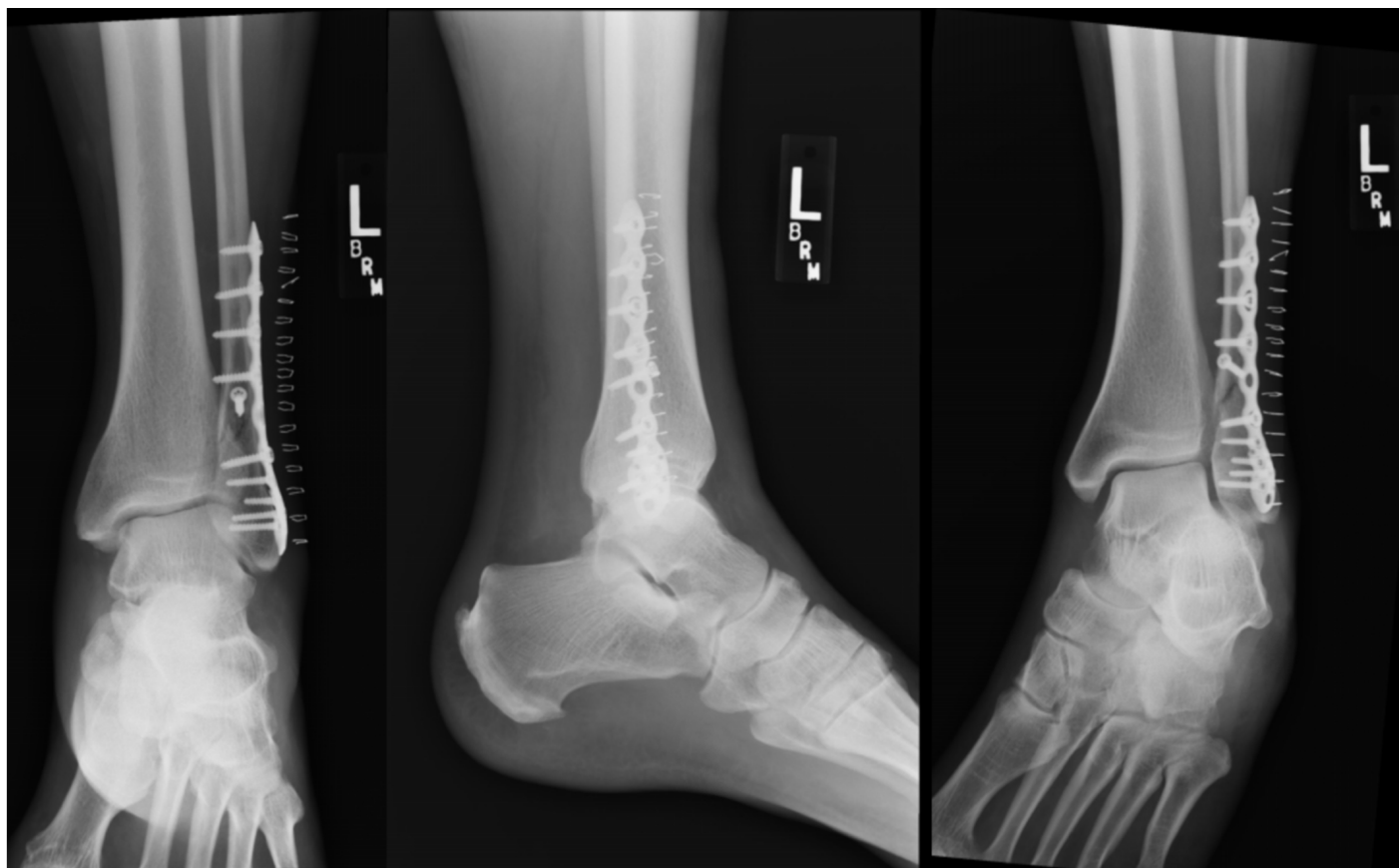


Figure 4.

AP, Lateral, and Medial Oblique left ankle radiographs taken one-week post-surgery (18 days post-injury) revealed the fixated fracture. An Arthrex titanium plate was placed on the distal fibula. An interfragmentary screw was placed first to join the two segments, then a combination of cortical screws, distal locking screws, and proximal locking screws were used to secure the plate, totaling 10 screws. The skin was closed with staples – 18 of which can be seen in the radiograph.

Weber Classification (Danis-Weber Classification)⁹

The Weber classification (or Danis-Weber classification) categorizes distal fibula fractures based on their relation to the ankle joint syndesmosis, guiding treatment decisions. Weber A is a stable fracture of the lateral malleolus, distal to the tibial plafond, without disruption to the syndesmo-

sis or deltoid ligament. Weber B is a fracture through the fibula at the level of the tibial plafond with potential for syndesmosis and deltoid ligament disruption or medial malleolar fracture. These fractures are variable in their stability and may require further imaging and possible ORIF surgery. Weber C is an unstable fracture proximal

Key Messages

- Ottawa ankle rules are decision rules to determine the need for radiographs in acute ankle injuries.
- Gravity ankle stress views are a useful tool to assess ankle stability on radiographs.
- The Weber classification system enables clinicians to assess lateral ankle fractures based on radiographic criteria to create a follow up plan.

to the level of the tibial plafond with an associated injury to the syndesmosis often requiring ORIF surgery. There is commonly a fracture of the medial malleolus with deltoid ligament injury.

Summary

The utilization of OAR plays an intricate role in the management of suspected lateral ankle fractures. Combined with the use of the Weber classification system and gravity stress views, chiropractors can properly evaluate the stability of the ankle and understand the potential for surgical intervention.

References

1. Jenkin M, Sitler MR, Kelly JD. Clinical usefulness of the Ottawa Ankle Rules for detecting fractures of the ankle and midfoot. *JAT*. 2010;45(5):480–482.
2. Stiell IG, McKnight RD, Greenberg GH, McDowell I, Nair RC, Wells GA, Johns C, Worthington JR. Implementation of the Ottawa ankle rules. *JAMA*. 1994;271(11):827–832.
3. Abbasian M, Biglari F, Sadighi M, Ebrahimpour A. Reliability of Postoperative Radiographies in Ankle Fractures. *Arch Bone Jt Surg*. 2020 Sep;8(5):598–604. doi: 10.22038/abjs.2020.43134.2173. PMID: 33088861; PMCID: PMC7547165.
4. Hermans JJ, Wentink N, Beumer A, et al. Correlation between radiological assessment of acute ankle fractures and syndesmotic injury on MRI. *SkelRadiol*. 2011;41(7):787–801. doi:10.1007/s00256-011-1284-2
5. Endara-Mina J, Kumar H, Ghosh B, et al. Comparative use of ultrasound and radiography for the detection of fractures: a systematic review and narrative synthesis. *Ann Med Surg*. 2023;85(10):5085–5095. doi:10.1097/ms9.0000000000001229
6. Pitakveerakul A, Kungwan S, Arunakul P, Arunakul M. Radiographic parameters in gravity stress view of the ankle: normative data. *Foot Ankle Surg*. 2018;25(6):819–825.
7. Michelson M, Varner K, Checcone M. Diagnosing deltoid ligament injury in ankle fractures: the gravity stress view. *Clin Orthop Relat Res*. 2001;387:178–182.
8. Gill JB, Risko T, Raducan V, Grimes JS, Schutt RC. Comparison of manual and gravity stress radiographs for the evaluation of supination-external rotation fibular fractures. *J Bone Joint Surg Am*. 2007;89(5):994–999.
9. Weber BG. *Die Verletzungen des oberen Sprunggelenkes*. 2nd. ed. Huber eBooks. 1972.