

IS ANKLE DISLOCATION WITHOUT FRACTURE A RARE OCCURRENCE IN NORTHERN GHANA? A REPORT ON FOUR CASES

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ABSTRACT

The ankle joint proper or tibio-talar joint or talo-crural joint connects the leg to the foot. It is a stable, synovial, hinge joint with plantar-and dorsi-flexion movements. The ankle joint may also be defined to include the region embracing the distal tibio-fibular joint (Syndesmosis), the tibio-talar joint and the sub-talar joints. Ankle joint stability depends on the "Ankle mortise shape" architecture, the presence of a strong joint capsule and ligaments (Deltoid, the anterior talo-fibular, calcaneo-fibular and posterior talo-fibular ligaments, not forgetting the syndesmosis). Large amount of force is therefore needed to be applied to the ankle to cause ankle joint dislocation, without fractures [18]. Literature states [1 13,14] that the condition is rare. The objective of this study was to highlight the rarity or otherwise of the injury in Northern Ghana. A descriptive retrospective study of four (4) cases, two (2) closed antero-lateral and two (2) opened lateral tibio-talar dislocations without fractures, spanning from June 2009 to December 2013 was undertaken. All patients were males, who were involved in road traffic accidents as high energy trauma [18] within Northern Ghana. The first two of these patients were aged 25 and 28 years, with missed diagnosis of their conditions for three (3) and four (4) weeks respectively prior to self-reporting to Tania Specialist Hospital, Tamale, Ghana: and the other two (2) patients were both 30 years old. They presented with fresh, opened lateral ankle dislocations within six hours following the accidents. Following patients stabilization, emergency surgical wound exploration, tissue debridement, wound irrigation, talus reduction, joint capsule and anterior talo-fibular ligament repair without tension with vicryl-0 suture, a flat drain was inserted. Primary wound closure was accomplished. Control radiographs were done intra operatively with the C-Arm machine and a below knee circular POP cast was applied, with a window for wound dressing. Post-operatively, the "RICE" (R=Rest, I=Immobilise, C=Cool, E=Elevate) principle was observed for 10-12 days. Post-discharge immobilization continued for six (6) weeks for opened dislocated cases and eight (8) weeks, for closed missed diagnosed cases and the rest of the follow-up schedule were three (3) months, six (6) months and nine (9) months. Full body weight bearing was authorized at the (6) sixth month visit, when painless and full ankle movements were elicited.

Conclusion: The otherwise rare injuries around the world, (pure dislocations of the ankle joint) are now common in Northern Ghana. The rate, complexity and severity of road traffic accidents in Northern Ghana is alarming. Detailed history taking, complete physical examination and radiographs investigations are essential for correct and early diagnosis, management or referral.

Keywords: Trauma, injury, ankle dislocation, Northern Ghana.

CASE REPORT

A 25 year old ICT teacher and businessman was involved in a road traffic accident in Bawku in June 2009, Ghana, while escaping from a chieftaincy conflict. He had a closed antero-lateral

dislocated talus bone on his right foot (Dorsum) for three (3) weeks. The diagnosis was missed at a district hospital in Zebilla, Ghana. Patient self reported to Tania Specialist Hospital, Tamale, three (3) weeks following the injury. Anterio-lateral talus closed dislocation was confirmed. Patient was immediately prepared for surgery.

Surgery was done same day. Ankle and foot were explored, debridement of tissues, irrigation of wound, reduction of talus, joint capsule and anterior talo-fibular ligament were reconstructed tension-free using vicryl -0 suture and insertion of a flat-drain done. Intraoperative control radiographs of the right ankle and foot was done with the aid of a C-Arm machine. A below right knee circular POP cast, with a dressing window was applied.

Post operatively the “RICE” principle was observed for 12 days. Patient was discharged home, in POP cast to observe the “RICE” procedure further and no body weight bearing for 8 weeks. POP cast was removed after the 8th week post-operative period, following a check radiograph. The rest of the follow-up schedule were three months, six months and nine months. Patient was authorized full body weight bearing after 6 months, when painless and full ankle joint movements were elicited. A similar procedure was carried on a 28 year old pastor, involved in a road traffic accident in Navrongo in December 2013, Ghana, 4 weeks prior to coming to Tania Specialist Hospital, with a missed diagnosed closed anterio-lateral talus dislocation. The pastor was first admitted at the War memorial (a government) district hospital in Navrongo for one week and discharged home. The outcome of this management was the same as the ICT teacher.

The third case was an NGO (Non-Governmental Organization) social worker, male, 30 years of age, who was involved in a road traffic accident in May 2011, in Gushegu, Ghana. He was rushed to Tania Specialist Hospital with a 4th degree opened lateral talus dislocation of the right lower limb: patient was brought within 6 hours after the accident.

Following stabilization of patient and confirmation of the injury, emergency surgery was done. Ankle and foot exploration, wound debridement, irrigation of wound, talus reduction, joint capsule and anterior talo-fibular ligament reconstruction tension-less with vicryl-0 suture and insertion of a flat drain were done. Control radiographs of the right ankle and foot were done intra operatively. Below right knee circular POP with window for dressing was applied. Post-operatively, “RICE” principle was observed for 10 days. Patient was discharge home in POP cast, without body weight bearing for 6 weeks. Patient was reviewed after 6 weeks with a check radiograph of the right ankle and foot. Subsequent following schedule were 3/12, 6/12 and 9/12. Patient was authorized full body weight bearing after 6/12 when painless and full right ankle movement were elicited.

A similar procedure was done in December 2011 on a sheanut businessman, 30 years, who was involved in a road traffic accident within the Tamale Metropolis. He was brought to Tania Specialist Hospital, within two hours after the accident with a third degree opened lateral talus dislocation. His condition outcome was the same as that of the NGO social worker.

DISCUSSION

The ankle joint is a stable, hinge, synovial joint. It bears 3-5 times the body weight when one is walking normally. This factor increases several fold during running and jumping activities. Ankle joint stability is ensured among other factors by the “Mortise-Ankle shape” architecture, presents of

a strong joint capsule, fortified by the surrounding joint ligaments. Isolated ankle joint dislocation without any associated fractures is rare [1,13,14]. [7] reported ankle dislocation, without fractures was limited to only two private cases studied, and only fourteen (14) cases that had been previously reported from foreign and English literature between 1913 and 1939. This type of injury only occurs when a strong (high velocity force) is applied to the ankle joint [10], like in sporting activities such as football, gymnastics and hockey. It can also occur from a fall from a height, stair-case and a direct ankle trauma from road traffic accident. It may indicate a severe injury with disruption of almost all ligaments and joint capsule attachments of the talus [10].

Plantar flexion, puts the foot in supination, which exerts inversion strain on the ankle and foot. Dorsiflexion, pronates the foot and exerts syndesmosis strain on the deltoid ligament and medial malleolus, thus predisposing the ankle and foot to injury. Literature further states that children and adolescence have the most ankle dislocations [21] this was contrarily to our findings, where patients were aged between 25-30 years. Ankle dislocations are also said to be more frequent in young males (18-41 years) than in any other group [20]. This concurs with our findings.

Following ankle dislocation, there exist the following risks: neurovascular injury, avascular necrosis of talus, wound infection, anaemia or shock due to bleeding, permanent sensory loss or nerve damage, lower extremity tissue necrosis, and gangrene if not properly managed. Tented skin may be subjected to ischaemic stress. However, some reported cases of total talus dislocation without osteonecrosis may occur[9]. Reduced range of motion and osteoarthritis in any three regions of the ankle joint are also predictable complications[15-17]. That was not seen in this study.

Some controversy still exist regarding the treatment for ankle joint dislocations, whether conservative therapy first before surgery or direct to surgery, especially for closed talus dislocation. However, the outcomes according to literature, appear to be satisfactory if cases are treated with immediate reduction of the joint and relief of neuro-vascular stress as the primary goals of treatment. We advise direct surgery since this study showed 100% of missed diagnosis (closed ankle) of the condition and therefore late reporting to the appropriate orthopaedic centre for correct diagnosis and management. For opened cases, surgery prevents blood loss, wound infection and other complications. [19], evaluated complete talus extrusion without associated fractures and immediate re-implantation and reported that it is important to attempt re-implantation of the talus because of the good final outcome. They reduced the talus and held it in place with 2 steinman's pins, placed from the inferior aspect of the calcaneus, through the talus, and into the inferior aspect of the tibia: thus an external fixator was used to stabilize the limb. We however did not use any internal or external implants in all our cases. In the diagnosis of ankle dislocation, the use of radiographs is imperative. Plain radiographs help to evaluate the extent of the damage to the ankle joint, determine the position of the dislocated bone and rule out the possibility of fractures. This we did. In resource unlimited areas, MRI (Magnetic Resonance Imaging) could have been done to evaluate the extent of damage to the soft tissues surrounding the dislocation. It was not done in this study, because no MRI machine exist in Tamale, Ghana, for now. Then also the cost of the MRI investigation(s) may also be out of reach for some poor patients.

Preventive methods of ankle dislocations include the use of ankle supports, ankle braces or other protective gears or sports men and women must warm-up adequately before any serious sporting activity. Drivers and motor-bike-riders, must protect themselves well and also obey laid-down driving and riding regulations. Correct diagnosis, early and appropriate surgical interventions can

save these situations. Seyed et al, reported at six (6) months post- operation follow-up that the talus did not show subluxation and/or avascular necrosis. This concurs with our findings. Our patients could at six (6) months bear full body weight on the affected Ankle joint, with painless full movements.

CONCLUSION

This study has high-lighted that in Northern Ghana, complex injuries like isolated ankle dislocations are not rare. Road traffic accidents are the sole causes of the injuries. Capsular, ligamental and neurovascular injuries must be borne in mind, while managing such cases. Detail clinical history taking, complete physical examination and radiographs in at least two (2) plains are mandatory in all suspected cases. Early referral is advised.

REFERENCES

1. Daruwalla J.s. (1974): Medical dislocation of the ankle without fracture a case report injury 5, 215.
2. Fahey J.J & Murphy J.L (1965): Talo tibial dislocation unassociated with fracture; surg. Clins N. Am 115;80
3. Fonda, M. (1952) Dislocation of the tibiotalar joint without fracture. An unusual ski injury: J Bone jt surg, 34A, 662.
4. Haines C (1939) compound dislocation of the tibiotakar joint without fracture and without separation: Ibid, 21, 205.
5. Kelly P.J. & Peterson L.F.A. (1962), compound dislocation of the ankle without fracture. Am. J. surg. 103,170
6. Lerud S. (1971), subluxation of the ankle without fracture of the fibule, Ibid 53A, 594
7. Wilson M.J. Michele A.A. & Jacobson W.E. (1939), ankle dislocations without fracture; J Bone joint surg, 21, 198
8. Woods, R.S. (1942), Irreducible dislocation of the ankle joint: br. J. Surg. 29, 359
9. Halliburton R.A, Sullivan C.F, Kelly P.J. & Peterson L.F.A, (1958): The extraosseous and intraosseous blood supply of the Talus: Ibid 40A, 1115
10. Seyed Reza Sharifa, Mohammed H.E Hosein A.C. & Javad K.M., Cases journal 2009: 2:9136
11. Hiraizum T., Hara T., Takahashi M., Mayehiyo S.: Open total dislocations of the Talus with extrusion (missing Talus): a report of two cases: Foot, Ankle 1992, 13(8):473-7
12. Krasim E., Gold with M, Otremski L.; complete open dislocation of the talus: J Accid. Emerg. Med 2000, 17:53-54
13. Taymaz A. Gunal L. complete dislocation of the talus on unaccompanied by fracture. J. Foot, ankle surg. 2005. 44(2): 156-158
14. Segal D. Swasilewski S; total dislocation of the talus J. Bone joint surg. (A/M) 1980 62:1370-1372
15. Guskin J.S.H. Pimple M.K closed total talus dislocation without fracture: a report of two cases: Eur. J orthop. Surg. Traumatol. 2007
16. Hussain A. Chorth m. Prasad K: Total dislocation of talus, J.K. Practitioner 2001;37-39
17. Schiffer G., Jubel A. Eisner A., Andermahr J.: complete talar dislocation without late osteonecrosis, clinical case and anatomic study: J foot, ankle surg. 2007:46(2) 120-3

18. Rivera F, Bertone C-De-Martino M., Piebobono D., Ghisellini. F.: pure dislocation of the ankle; three case report and literature review: *clin. Orthop Rd. Res* 2001, 382:179-184
19. Karampinas P, Vlamis J, Eustratios K, Pneumatios S; tibiotalar joint stabilization by Steinman pins in Oestern- tscherne type III open fracture dislocation of the ankle; *Brit.journal of medicine and research* ,jan. 2014
20. Moehring HD, Tan RT, Marder RA, Lian G; ankle dislocation: *J. orthop. Trauma* 1994;8(2):167-72
21. Thangarajah T, Giotakis N, Matovu E; bilateral ankle dislocation without malleolar fracture. *J. foot ankle surg.* Sept- oct 2008;47(5):441-6.