



AN UNUSUAL FARM MACHINERY INJURY OF LEG BY TILLER BLADE OF HAND TRACTOR IN NORTH-EAST INDIA- A CASE-REPORT

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ABSTRACT **Introduction-** Farm machinery injury is common in India due to the lack of proper training and precautions. In this case report, we present a case of an extraosseous tiller blade of tractor embedded in the left leg causing severe crush injury. The foreign body was removed without any further neurovascular compromise and improvement was noted in symptoms and functions of the limb. This is the first case of its kind in the literature to which we had access. **Case Presentation-** A male patient, 45 years of age, arrived at our emergency department with an alleged history of machinery injury by the tiller blade of a hand tractor to his left leg while tilling farmland in a very far-flung interior area of Dhemaji district of Assam. The patient was hypotensive and tachycardic at presentation. Examination revealed an entry wound and exit wound with the tiller blade of the tractor in situ. The left anterior tibial artery and dorsalis pedis artery pulsations were absent. Sensations were present and oxygen saturation was normal in all the toes. Examination revealed no other major injuries. **Conclusion-** This study will serve as a base for doctors to approach patients with unusual machinery injury which gets embedded in extremities. Also, it focuses on the steps to be taken for the prevention of farm injuries by the government and local population. This case report will have an interest to clinical specialties like Orthopaedics, Emergency medicine, Cardiovascular surgery, and plastic surgery.

KEYWORDS :

INTRODUCTION:

Agriculture, the backbone of India is the main source of income for many rural people. So, agriculture-related accidents are also very common among farmers.¹ The farm machinery accidents are increasing due to lack of proper safety precautions, improper handling of instruments, and poor quality of machines.² As far as the tiller blade of the tractor is concerned, in most cases, it caused fractures and even amputation of extremities.

It is rare that a large metallic object capable of causing such grievous injury to the patient to persist as a foreign body within the leg and poses challenges to its removal because of the vital neurovascular structures which may be already injured and which are endangered because of its proximity. In the literature, there are few studies about farm accidents. However existing studies determined that farm accidents are a remarkable cause of morbidity and mortality.³⁻⁵

In this case report, we present a case of an extra osseous tiller blade of tractor embedded in the left leg causing severe crush injury. The foreign body was removed without any further neurovascular compromise and improvement was noted in symptoms and functions of the limb.

Case Report:

A male patient, 45 years of age, arrived at our emergency department at Assam Medical College and Hospital, Dibrugarh with an alleged history of machinery injury by tiller blade of hand tractor to left leg while working in the farm. The patient arrived at the emergency department 4 hours after the accident.

After analyzing the history, the mechanism of injury can be explained as follows. The patient was tilling his farm land in a very far-flung interior area of Dhemaji district of Assam, with the help of a hand tractor in preparation for cultivating rice for the next season. It was evening and he was about to wind up his work for the day as he was already tired and his co-workers had already left the field. He was in a hurry when he suddenly applied the brake of the hand tractor that it slipped out of hands and fell back onto him. His left leg got injured by the rotating tiller blade which injured his left leg before it came to a halt. There was severe bleeding and he could not take his leg out of the tractor. He screamed out for help and for his luck a worker from the nearby field came to his rescue and disassembled the tiller blade which was stuck to his leg from the hand tractor and tied a towel tightly around the wound. He was taken to our hospital which is about 90 kms away from his farm in an ambulance.

The patient was hypotensive and tachycardic at presentation. Examination revealed an entry wound of size 3cm×2cm in the anteromedial side of proximal to middle one third of left leg and exit wound of size 2cm×1cm in the anterolateral part of middle to distal one-third of left leg with the tiller blade of tractor in situ (Fig 1). His left anterior tibial artery and dorsalis pedis artery were not palpable. Sensations were present and SpO₂ was normal in all the toes. Examination revealed no other major injuries.

In the emergency room, primarily we monitored the patient for hemodynamics, opened 2 large bore vascular lines and one unit of whole blood was transfused and a total of 1.5L of saline was given. Tetanus prophylaxis and first dose of parenteral antibiotics [Ceftriaxone, amikacin and metronidazole] were administered. The removal of soil and dirt from the wound was done and irrigation performed slowly in the emergency room and the left leg was stabilized in a above knee slab. The patient became normotensive after initial resuscitation.

Emergency Doppler ultrasonography of left leg showed mildly reduced flow with biphasic pulse in the left anterior tibial artery. CT Angiography showed sudden non-visualization of left anterior tibial artery in the left lower third of leg with surrounding collection, foreign body, air foci and skin laceration. X-rays revealed no obvious fractures (Fig-2). Emergency blood investigations were within normal limits and his medical history was unremarkable. The cardiovascular surgery opinion was taken before proceeding to surgical intervention.

Patient was taken to operating room, and under spinal anesthesia, careful dissection of the soft tissues was done and the tiller blade measuring around 22cm in length and 10 cm broad was extracted out without further injuring adjacent nerves and vessels. Severe crushing of muscles at the level of injury was noted in all the compartments of leg. Blood clots were seen to be compressing anterior tibial artery and were removed. Thorough and meticulous debridement was done and wound was washed with Hydrogen peroxide and 0.9% normal saline. Soft tissue repair was done and wound was kept open. Distal pulses were felt and SpO₂ was checked and found to be normal in all toes. Antiseptic dressing was done and patient was shifted out of operation theatre after anesthesia clearance. Sensations were intact but movements were restricted in the toes due to the extensive muscular crush suffered at time of injury. Physiotherapy was started from Day 1. There was continuous serosanguinous discharge from the wound and debridement was repeated again on 5th postoperative day and the wound was kept open to allow secondary healing.



Fig1: Left leg with blade

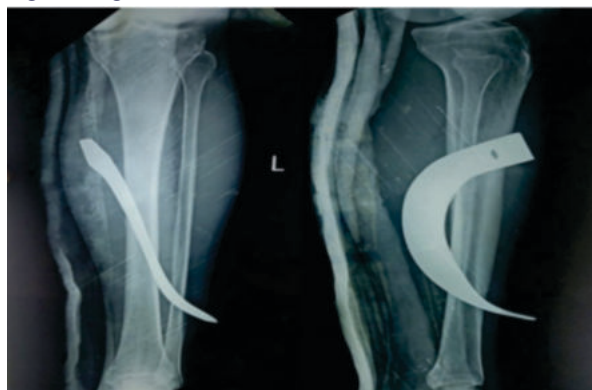


Fig 2: X-ray of left leg showing tiller blade



Fig 3: Intraoperative showing tiller blade

DISCUSSION:

Agriculture related accidents are very common in all parts of India and a majority of these are due to farm machinery like tractors. Accidents are more common during harvesting season due to work overload and stress.^{2,6} Most of them are non-fatal but may lead to fractures and amputation of extremities. This case had a very unusual presentation. Due to the absence of major bony or joint involvement at the time of injury and the precautions taken during surgery, the patient recovered well with painless good range of movement at knee, ankle and small joints of foot.

Doctors working in emergency department should be aware of the fact that farm machinery accidents are often associated with severe neurovascular and soft tissue injuries along with fractures. Maintaining the hemodynamic stability of the patient is of utmost importance before any intervention. Removal of large metallic sharp foreign body like the tiller blade of tractor should not be attempted in the emergency department due to the possibility of injuring neurovascular structures in proximity. Since there is high chance of severe contamination by organic materials in farm injuries, wound should be debrided and kept open for adequate drainage and

facilitation of secondary healing. A team consisting of Orthopaedic surgeon, cardiovascular surgeon, plastic surgeon should evaluate the patient before proceeding to surgery. Meticulous dissection should be carried out to avoid further injuries. Postoperatively neurovascular status should be assessed and documented.

Governments should develop regulatory and precautionary measures to decrease accidents in the agricultural sector. Regular training programs should be arranged and farmers should be educated regarding the safety measures. Farmers too should take responsibility to exercise all precautionary methods while working on the machines.² Regular visits by government officials to ensure the prescribed standards of farm machines is mandatory. These steps will help in reducing the farm machinery related accidents in our country.

CONCLUSION:

The case presented here is important as we found no similar report in the literature to which we have access. This study will serve as a base for doctors to approach patients with unusual machinery injury which gets embedded in extremities. Also, it focuses on the steps to be taken for prevention of farm injuries by the government and local population.

Clinical Message:

With increased industrialization of farming sector, machinery injuries are likely to increase in the future. Proper training programs should be conducted at frequent intervals and primary care givers should be educated to send these patients to tertiary care center at the earliest. The approach to removal of a large metallic foreign body which can potentially cause further neurovascular injury is described which can serve as a basis for reference as studies related to this topic is rare in literature.

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On behalf of all authors, the corresponding author states that there is no conflict of interest.

REFERENCES:

1. Turgut K, Gürbüz S. Hoeing machine accident: a case report. *Rural Remote Health*. 2018 Dec;18(4):4636.
2. Vaishnav D, Kr S, Singh D. A Rare Fatal Head Injury and Crush Injury to Leg by an Improperly Assembled Chaff Cutter – a farm Machinery-Related Injury in North-West India: a Case Report. *Int J Med Toxicol Forensic Med*. 2017;7(1):69–72.
3. Molineri A, Signorini ML, Tarabla HD. Risk factors for work-related injury among farm workers: a 1-year study. *Rural Remote Health*. 2015;15(2):2996.
4. Hansen TB, Carstensen O. Hand Injuries in Agricultural Accidents. *J Hand Surg (European Vol)*. 1999;24:190–2.
5. Akdur O, Ozkan S, Durukan P, Avsarogullari L, Koyuncu M, Ikizceli I. Machine-related farm injuries in Turkey. *Ann Agric Environ Med*. 2010;17(1):59–63.
6. Murali A. 12. Reddy, G.L. and Anuradha, R.V. (2013d). Disability and Farming in India: Problems and Prospects, *Cognitive Discourses, International Multidisciplinary Journal*, Vol. 1, Issue. 1, Pp. 14-27 (ISSN 2321-1075). *Cogn Discourses, Int Multidiscip J*. 2013 Jul 1;1:14–27.