

An Odd Presentation of a Tree-Related Injury

Farklı Bir Ağaçla Yaralanma Olgusu

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ABSTRACT

We are reporting a tree-related injury of a young adult who was thrown out through the windshield of a vehicle after a traffic accident and brought to the emergency room with a large tree branch stuck in his leg. Tree-related injuries are associated with difficult weather conditions, tree-stands of hunters and traffic accidents. When faced with such injuries, large branches should be carefully removed, care should be taken to avoid secondary damage caused by small branches and splinters and ultrasonography should be preferred primarily for imaging in cases where there is a suspicion of splinter injuries.

Keywords: splinter, traffic accident, tree-related injury, ultrasonography, wooden foreign bodies.

ÖZ

Bir trafik kazasından sonra aracın ön camından dışarı fırlayan ve bacağına büyük bir ağaç dalı saplanmış şekilde acil servise getirilen genç bir yetişkinin yaralanması olgusunu bildiriyoruz. Ağaçla ilgili yaralanmalar, zor hava koşulları, avcıların ağaçtan yapılma gözetleme alanları ve trafik kazaları ile ilişkilidir. Bu tür yaralanmalarla karşılaşıldığında büyük dallar dikkatlice çıkarılmalı, üzerlerindeki küçük dallar ve kıymıkların neden olabileceği ikincil hasarlardan kaçınmaya özen gösterilmeli ve kıymık yaralanması şüphesi olan durumlarda görüntüleme için öncelikle ultrasonografi tercih edilmelidir.

Anahtar kelimeler: kıymık, trafik kazası, ağaçla ilgili yaralanma, ultrasonografi, tahta yabancı cisimler.

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In Turkey, orthopedic surgeons are faced with injuries in many different ways, given the population density of the agricultural and industrial sectors, the frequency of traffic accidents and religious traditions such as the Feast of Sacrifice (1-5). Tree-related injuries, on the other hand, are associated with hurricanes or tree-stands of hunters in the literature, and not very common in our country (6-8).

We are reporting a case of odd injury mechanism regarding a young adult with a large tree branch stuck in his leg after a traffic accident and carefully removed in order to prevent secondary damage caused by splinters.

CASE REPORT

A conscious 18-year-old male patient was brought to the emergency room due to a traffic accident and it was observed that a large tree branch, approximately 50 cm in length and 10 cm in diameter, was stuck in his upper thigh and advanced from anteromedially to a posterolateral direction (Figure 1). In his story, he stated that while traveling without a seat belt in the front passenger seat, the driver lost control of the car, the vehicle rolled over, he was thrown through the windshield, got stuck into a tree, and fell to the ground after the branch he was stuck on was broken. During the examination of the patient, it was observed that his general condition was good, he was conscious and cooperative, and did not have any other injuries. Although the large



Figure 1. The large tree branch, that was stuck in the patient's upper thigh can be seen.

branch stuck in his thigh was advanced posterolaterally and forced the skin posteriorly, the posterior skin integrity was intact. Patient's range of motion was limited due to pain but his distal pulses were palpable and he had no neurological deficits. Although not performed under optimal conditions, direct radiography and computed tomography images did not show any evidence of fracture (Figure 2). The tree branch stuck into the mid-proximal area of the thigh and advanced posterolaterally, passing right next to the femur without damaging it and through the quadratus femoris muscle. Bilateral iliac arteries, common femoral artery and popliteal artery were all intact.



Figure 2. No fractures were seen in the radiographs. CT-angiography images were used to confirm that there were no fractures and the integrity of the vessels were not disrupted.

After applying tetanus prophylaxis according to the guidelines and taking the informed consent of the patient, he was taken into the operating room (OR) and surgery was initiated after the antibiotic prophylaxis. It was decided that the part of the tree branch outside the body should be cut first, then the interior part should be removed by pushing through the posterior of the thigh, because the smaller branches and splinters on the large tree branch were stuck when they entered the skin and if we try to remove the large branch by pulling, these smaller branches and splinters may damage the soft tissue or neurovascular structures inside. Since there was no surgical equipment large and strong enough to cut the branch of this size in the OR, a hacksaw was brought from the boiler's room of the hospital. Following general anesthesia, the part of the large branch that was outside of the body was cut from the skin contact point (Figure 3). A 10-centimeter



Figure 3. The part of the large branch that was outside of the body was cut from the skin contact point with a hacksaw.



Figure 4. Smaller branches and splinters on the large tree branch are seen

incision was made posteriorly, exactly where the branch has forced the skin, and the remaining part of the large branch was pushed through the thigh. While the piece was being pushed out, we observed that the smaller branches and splinters on the piece had opened up like an umbrella as they came out of the body (Figure 4). The wound was washed with sterile 10.000 cc saline solution and the operation was terminated after suturing.

The patient was admitted to the service postoperatively. After five days of appropriate antibiotic prophylaxis, wound site follow-up and controlled mobilization of the patient without any support, the patient was discharged. The patient was followed-up for a year by monthly checks and range of motion and neurovascular examination were evaluated at each control. Patient has recovered and gained his painless and full range of motion with no complications.

DISCUSSION

Tree-related injuries are quite common, especially in the United States of America (USA), regarding the popularity of deer hunting and the frequency of hurricanes. Marshall *et al.*⁶ reported more than 600 tree-related injuries in their study with a significant increase after hurricanes. VanWormer *et al.*⁷ have stated that tree-stand related injuries are the most common injuries of hunters in USA. On the other hand, Hakakian *et al.*⁹, in their retrospective study of 11.677 trauma admissions, reported that main cause of tree-related injuries was motor vehicle accidents. Although hunting and difficult weather events are not frequent in our country, considering the frequency of traffic accidents, it is inevitable to encounter tree-related injuries in daily practice in Turkey.

Aside from safety, the most common reasons for wearing a safety belt are habit and fear of penalties (10). In our case, the patient who was traveling in the front passenger seat did not use a seat belt, so he was being thrown out of the windshield at the time of the accident. The use of seat belts is one of the most important parameters in preventing injuries in traffic accidents and its use should be strongly encouraged.

We have administered early antibiotics and appropriate tetanus prophylaxis to the patient at the earliest possible time in the emergency department. Washout and debridement procedures were conducted in the OR, under general anesthesia and after the branch was pushed out. Wound site infection was not observed during the hospitalization, and post-discharge follow-up period. Regardless of the cause, early antibiotic administration, appropriate tetanus prophylaxis, early wound washout and surgical debridement (recurrent debridements if necessary) are the most important steps in the management of open fractures (11). Ozdemir *et al.*² have stated that administration of tetanus vaccine and antibiotics was routinely performed in their study of 49 open fractures. Our protocols for managing open fractures are compatible with the literature.

One of the most dangerous aspects of tree-related injuries is secondary damage due to injuries caused by smaller branches and splinters on a large branch. Splinter injuries are encountered in many different forms in the literature. Santangelo *et al.*¹² have treated a case of penetration of wooden splinter, causing intradural spinal injury. O'Connel *et al.*¹³ have reported a wooden splinter injury of a knee joint. Tree-related and splinter injuries could be challenging to treat, especially due to difficulties in the optimal application of imaging methods. Mercado *et al.*¹⁴ found that ultrasonography was superior to direct radiographies at identifying wooden splinters. In our case, we did not perform ultrasonography or additional imaging in our patient, considering the patient's pain-free full range of motion and our method of removing the large branch without harming adjacent anatomical structures. By preferring to push the piece out instead of pulling it back, we aimed to avoid the secondary damage caused by small branches and splinters getting stuck into the soft tissue. As a matter of fact, we saw that small branches and splinters popped out like an umbrella while the branch was pushed out.

In conclusion, tree-related injuries are not uncommon in our country. When faced with such injuries, large branches should be carefully removed,

care should be taken to avoid secondary damage caused by small branches and splinters and ultrasonography should be preferred primarily for imaging in cases where there is a suspicion of splinter injuries.

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REFERENCES

1. 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.
2. Ozdemir G, Bingol O, Ceyhan E, Deveci A, Yilmaz B, Yasar NE. Saw-related injuries of the lower extremity. *Injury.* 2020; 51 (6): 1373-6. doi: 10.1016/j.injury.2020.03.042.
3. Say F, Coşkun HS, Erdoğan M, Bülbül AM, Gürler D. Causes of open fractures: orthopaedic injuries related to home-made agricultural vehicles in the eastern Black Sea region of Turkey. *Turk J Med Sci.* 2016; 46 (4): 972-6. doi: 10.3906/sag-1411-151.
4. Puvanachandra P, Hoe C, Ozkan T, Lajunen T. Burden of road traffic injuries in Turkey. *Traffic Inj Prev.* 2012; 13 Suppl 1: 64-75. doi: 10.1080/15389588.2011.633135.
5. Caliskan HM, Erturk ZK, Ocak M, Celik B. Injuries related to animal sacrifice during the Feast of Sacrifice in Turkey. *Ann Saudi Med.* 2020; 40 (3): 219-26. doi: 10.5144/0256-4947.2020.219.
6. Marshall EG, Lu SE, Williams AO, Lefkowitz D, Borjan M. Tree-Related Injuries Associated With Response and Recovery From Hurricane Sandy, New Jersey, 2011-2014. *Public Health Rep.* 2018; 133 (3): 266-73. doi: 10.1177/0033354918766871.
7. VanWormer JJ, Holsman RH, Petchenik JB, Dhuey BJ, Keifer MC. Epidemiologic trends in medically-attended tree stand fall injuries among Wisconsin deer hunters. *Injury.* 2016; 47 (1): 220-5. doi: 10.1016/j.injury.2015.09.012.
8. Terry J, Griffin R, Rue LW 3rd, McGwin G Jr. Epide-

- miology of tree stand-related injuries in the United States from 2000 to 2007. *J Trauma*. 2010; 68 (3): 712-5.
doi: 10.1097/TA.0b013e3181a3a903.
9. Hakakian D, Del Rosario AG, Bogdanovski DA, Cole AM, Curran T, DiFazio LT, et al. Analysis of Injury Patterns Due to Tree-Related Trauma. *Am Surg*. 2018; 84 (9): e407-10.
<https://doi.org/10.1177/000313481808400925>
 10. Simşekoğlu O, Lajunen T. Why Turks do not use seat belts? An interview study. *Accid Anal Prev*. 2008; 40 (2): 470-8.
doi: 10.1016/j.aap.2007.08.002.
 11. Schade AT, Khatri C, Nwankwo H, Carlos W, Harrison WJ, Metcalfe AJ. The economic burden of open tibia fractures: A systematic review. *Injury*. 2021; S0020-1383(21)00125-X.
doi: 10.1016/j.injury.2021.02.022.
 12. Santangelo G, Stone J, Schmidt T, Vates GE, Silberstein H, Girgis P. Imaging and surgical approach to a pediatric penetrating intradural wooden splinter: case report. *J Neurosurg Pediatr*. 2018; 21 (4): 409-13.
doi: 10.3171/2017.10.PEDS17215.
 13. O'Connell RL, Fageir MM, Addison A. Be aware of wood in the knee. *BMJ Case Rep*. 2011; 2011: bcr0720114551.
doi: 10.1136/bcr.07.2011.4551.
 14. Mercado LNS, Hayre CM. The detection of wooden foreign bodies: An experimental study comparing direct digital radiography (DDR) and ultrasonography. *Radiography (Lond)*. 2018; 24 (4): 340-4.
doi: 10.1016/j.radi.2018.04.004.