

Clinical Note

A death due to electrical injury through external ear canals

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Electricity has caused important differences in our social life, and it has been involved in our daily life for the improvement of the technology. Consequently, there is an increase in ratio of accidents due to electricity.¹ We often confronted children to electrical accidents at home, and adults are faced to these accidents usually at work.^{2,3} We rarely observed both suicides and murders by the electrical current such as accidents during autoerotic practice.⁴ Contact points of electricity are often in the extremities, but in most cases the mouth (especially in children), anus or penis is the contact point found in the literature.¹ Current follows the shortest way to reach the ground. This way is often between hand and foot. Deaths and injuries due to electrical current are related to the amount of the current, voltage, and the resistance of the tissues.²

Our case is very different from the others in terms of contact points. This case, in which contact points of electricity are external ear ways, is also presented in order to bring in the attention of the parents that children are under risk of injuries related with electricity at home, and make parents conscious of these accidents, and emphasize that children need more careful observation. A double cable which was smelt burn, and had a plug on one side while the other side is free, is found beside the corpse at the crime scene investigation of the incident, which occurred in Denizli City Center, Turkey. Her mother expressed that when she completed her job with vacuum cleaner in the other room and turned into, she saw her daughter lying unconsciously on the sofa having one of the ends of a dual cable into both ear and the other end to the wall socket. The cable was taken out from an old broken lampshade. Residual current circuit breakers were not installed in the house. Postmortem external examination of the child (3.5-year-old, 101 cm length, 15 kg weight) showed that there were current burn marks in both external ear ways (**Figure 1**). At the otoscopic examination there was bleeding, flow and cerumen plug in the external ear ways and both of tympanic membranes were perforated and bloody. There were petechial hemorrhages on the eyelids and conjunctivae. There were no additional possible contact zones on the body. The autopsy revealed that there were no macroscopical pathological findings in brain and cerebellum dissection and skull base. The chest and abdominal organs were also in natural appearance except lung edema and



Figure 1 - Right ear of the child.

petechial hemorrhages on the visceral pleura and epicard. Histopathological examination showed that there was a vascular congestion and intraalveolar edema of the lungs; postmortem changes in the heart, liver, spleen and kidneys, and osteolysis in the brain and cerebellum. Paralysis of cardiac and respiratory centers in brainstem due to current flow from ear to the ear was accepted as the cause of death.

A study which was performed in Turkey with 1,083 children and adults treated in Burn Departments reported that 78.8% of children, and 37.3 % of adults were confronted with accidents at home and 16.8% of children injured by electricity.⁵ Studies which were performed in other countries also reported that children are mostly injured due to low voltage current at home. Our case was different from others according to contact point. It is thought that the child inserted the ends of the cable into her ears such as a walkman (portable cassette player) while she was playing. Children are interested every objects in their surroundings and tried to recognize them without being aware of the risks. Consequently, they need more careful observation of their parents or attendants. We suggest that all institutions (especially media) must do their responsibilities in order to inform parents regarding home accidents and electricity. Being aware of the risks of electricity, the increase of protective mechanisms and the use of residual current devices decreases the deaths due to electrical accidents and injuries in USA. In Turkey, there have to be residual current circuit breakers for getting permission to usage of new buildings. But, most of the occupied old buildings, are not aware of having this system and this causes great risks for their residents especially for children. Awareness on electrical installation standards is a great help in decreasing the mortality and morbidity cases.

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