Surgery Journal 3 (4): 78-81, 2008
ISSN: 1816-3211

Amputation from Burn Following Epileptic Seizure

I.A. Adigun, K.O. Ogundipe and O.O. Abiola
Department of Surgery, Division of Plastic and Reconstructive Surgery,
University of Ilorin Teaching Hospital, P.M.B 1459, Ilorin, Nigeria

Abstract: Burn is one of the most disabling injuries with sequelae including morphological changes and psychological and functional impairments. Burn injuries in patients with epilepsy have been widely reported. During the short period of few minutes of unconsciousness that usually accompany an epileptic attack, patients may be exposed to heat resulting in severe and deep burns. We retrospectively review patients managed by the unit in the last 5-year. Only 2 cases of the burn injuries resulted from epilepsy. The injury was so deep and severe leading to amputation of parts of their extremities. There is need for attitudinal change towards the epileptic disorders as perceived by the patients themselves, the families and society in general. The importance of compliance to oral medications and more frequent follow up has to be emphasized to family members.

Key words: Burns, Epilepsy, Amputation

INTRODUCTION

Burn is one of the most disabling injuries that can ever be sustained by an individual. Its sequelae include morphological changes, psychological and functional impairments. Burn injury caused by seizures is a serious problem for patient with epilepsy that must not be underestimated (Spitz, 1992; Al-Quattan, 2000). Such burns are usually scalds and more often occur while the victims are performing daily activities at home. The injury is typically deep almost always requiring surgical intervention to heal (Jostv *et al.*, 2000). We review the total number of burn patients managed in our unit over the last 5 years. It was noticed that 2 patients suffered burn injury as a result of epilepsy leading to various types of amputations of their extremities.

MATERIALS AND METHODS

We retrospectively review patients' records managed by the unit from January 2003-December 2007. Two hundred and 50 patients were managed by the unit during the study period. Patients selected from this review suffered from epilepsy and presented with scald and open flame injuries after experiencing seizure while cooking at home. Though only 2 of the patients met the criteria for inclusion, the extents of the injuries sustained were enormous. Burn extent, location, depth and parts of the body lost were assessed. The treatments given were also assessed.

Case 1: Patient N. S., a 25-year old woman presented to our hospital with history of burn injury sustained while cooking at home about an hour before presentation. She was a known epileptic since childhood. She sustained the injury while preparing soya milk with firewood with a pot on a tripod stand; during which she had an episode of generalized tonic-clonic convulsion with loss of consciousness. She fell on the pot, her left upper limb and right foot went into the burning firewood sustaining an open flame injury to those parts of the body.

She also sustained scald injury to the right forearm and both knees from the hot soya milk. She was rescued by her relatives after some minutes and regained consciousness 30 minutes after the incident.

Examination revealed a conscious patient with circumferential full thickness burn over the distal 1\3rd of left forearm, left hand charred with flexure contractures of the fingers at the PIP and DIP joints as shown in Fig. 1. She also sustained full thickness burn on the dorsum of the right foot with charring of the 3rd, 4 and 5th toes. Others were partial thickness burn over the lateral aspect of the right forearm and both knees. Extent of the burn was estimated to be 13%.

A diagnosis of full thickness burn of the left forearm with dry gangrene of left hand and full thickness burn of the right foot with dry gangrene of the 3rd, 4 and 5th toes secondary to open flame and partial thickness burn of right forearm and both knees secondary to scald was made. She was resuscitated with IV-fluids with a good urinary output. Analgesics a nd prophylactic antibiotics

Corresponding Author: I.A. Adigun, Department of Surgery, University of Ilorin Teaching Hospital, P.M.B 1459, Ilorin, Kwara State, Nigeria

Fig. 1: Case 1 left hand showing the hand charred with flexure contractures of the fingers at the PIP and DIP joints

Fig. 2: Case 1 left upper limb following the disarticulation of the gangrenous left hand at the wrist joint and escharectomy

were commenced. An emergency escharotomies were done on the left forearm and right foot to improve perfusion to the parts of the body. Occlusive dressing with honey was done after the patient was haemodynamically stable. Neurology team was invited to review the patient who commenced her on Phenyton Sodium.

The need for amputation of the gangrene parts of the extremities was explained to the patient, she however refused to give consent until 6 weeks post injury. She had disarticulation of the gangrene. Left hand (Fig. 2) at the wrist joint, disarticulation of gangrenes right 3rd, 4th and 5th toes at the level of metatarsphelangeal joint. She also had wound excision of the remaining escar and slough. Daily dressing of the wound was done with healthy granulation being formed and she had split thickness skin grafting to cover the wounds (Fig. 3). She did well post-operatively and was discharged home 14 weeks after admission.

Case 2: B. F., a 30-year old pregnant woman, $G_3P_2{}^{+0}2$ alive with estimated gestational age of 28 weeks was referred from a peripheral hospital to our centre on the account of bilateral full thickness burn of both forearm and hand of 9 days duration. She was a known epileptic since childhood, she suddenly convulsed while cooking with a pot on firewood. She had generalized tonic-clonic convulsion with loss of consciousness. She fell over the cooking pot containing hot pap with the right forearm and hand going into the pot of hot pap while her left forearm and hand went into fire from the burning firewood. She sustained scald burns to the right forearm and hand with open flame burns to the left forearm and hand. She was rescued by her family members from the fire about 10 minutes after the attack; she regained consciousness at the referral centre.

Fig. 3: Case 1 patient following split thickness skin graft of the upper limb

Examination revealed a pregnant woman with a viable foetus at estimated gestational age of 28-weeks. She sustained full-thickness burn to the extensor surface of the right forearm, about 5 cm below the elbow, extending to the wrist and dorsum of the right hand. There was also a circumferential full thickness burn of the distal half (½) of the left forearm and hand. The fingers of the left hand were dark in colour, atrophied, no capillary refill at nail bed, with flexion contracture at the PIP and DIP joints. Extent of the burn was estimated to be 12%.

A diagnosis of bilateral full thickness burn of the right forearm secondary to scald and left forearm secondary to open flame with full thickness burn of the left hand with dry gangrene of the thumb; and the rest 4 fingers at the level of the metacarpophalangeal joint was

made. She had intravenous fluid, analgesic and antibiotics commenced. The neurology team was invited to review the patient. She was placed in carbamazepine tablet. At 24 h post presentation, she had escharectomies of both forearm and hand with daily honey dressing of the wound afterward.

The need for amputation of the gangrene left fingers was explained to the patient, she did not consent to it until 8 weeks after presentation. She eventually had disarticulation of the left hand fingers at the level of metacarpophalangeal joint. Immediate split thickness skin grafting of the remaining would could not be done as patient was termed at the time of operation (estimated gestational age by USS was 36±2 weeks).

Two weeks post-operation, she went into labour and was immediately transferred to the maternity wing of our hospital where she delivered a baby boy through caesarian section as a result of cord prolapse.

Two weeks post delivery, she was transferred back to the burns unit where alternate day wound dressing with honey was continued. The wound is being contemplated for skin grafting. Length of hospital stay is 16 weeks.

DISCUSSION

An increased incidence of burns has been recognized as a serious complication of epilepsy. During the 2-5 min periods of unconsciousness that usually accompany an epileptic attack, patient may be exposed to heat resulting in severe and deep burns even if only small area are involved (Jostv *et al*., 2002). Most injuries occur at home during ordinary daily activities such as cooking, showering or when using heaters, most of which could have been easily avoided by a few simple safety interventions (Spitz, 1992; Burocal, 1997).

The 2 patients presented constitute 0.8% of the total burn managed for 5 year period. They are women cooking at home when they experienced seizure attack. This is similar to the study by Meirelles *et al*. (2007) which noticed in their study that a significant number of patients had visual contact with the flame prior to the accident, showing that the fire could possibly be a photostimulator for seizures. This may be true as it has been reported that complex visual stimuli induced by the flames may trigger reflex seizures (Zirkin and Inoes, 2004). The suggestion that patients with seizure disorder should be prevented from flame related household cooking at home may not be practicable in our own environment. Unlike in some other culture where men cook or even assist in cooking for the family, it is solely the responsibility of a woman in our culture to cook for the entire family sometimes assisted by their children. It is however, sad to know that people with epilepsy are always isolated in our environment even by their immediate family members (husband, wife and children inclusive). It is believed in our culture that epilepsy is caused by an evil spirit that, has introduced a male lizard (an amphibian) into the body system of the affected person. The lizard had to be called out by incantations for the sufferer to get well. During a seizure attack the saliva that is foaming from the mouth of the patient is thought to be highly infectious and nobody is allowed to move closer to the site until the spot is burnt with kerosene fire. In Liberia, people interpreted epilepsy as being inflicted in a person either by spirit or by an enemy (Manktelow, 2000). Most Korean families consider having a patient with epilepsy in the family as bringing dishonour to the family and tend to conceal it, rather than to get help from other sources (Kinton and Duncan, 1998).

This often leads to seclusion either because of voluntary self isolation from both immediate and extended family members and the society at large. Epileptic are shunned by their neighbours, they may lose their spouse or their job and become considerably depressed and socially isolated (Danesi, 1982). There are also many co-morbid psychiatry and psychological disorders in epilepsy, which tend to cause isolation (Jostv *et al*., 2000).

The seizure type and frequency has been noted to be contributory to the risk of injury. Patients with generalized tonic-clonic seizures usually sustained more injuries than individuals with other types of seizures (Buck *et al*., 1997). Seizure frequency of more than once a month also increased the rate of injury. It is therefore not surprising that our patients also had generalized tonic-clonic seizures thus making them to sustained burn leading to loss of their extremities. The 2 of them have stopped taking their prescribed anti-epileptic drugs for a long time before the seizure attack. They have also been having frequent seizure attacks within a short period of time.

Loss of consciousness during and after the generalized tonic-clonic convulsion tend to cause deep scalding injuries to the upper extremities and trunk requiring long hospital stays and multiple surgical procedures (Jang *et al*., 2006). In the ictal or post-ictal state, the epileptic lacks the ability to withdraw from hot objects. Out of our review cases in the last 5-years, the 2 patients presented are the only recorded patients with burn injury secondary to epilepsy. The 2 of them suffered not only deep scalding injuries to the upper extremities and trunk but also deep open flame burn to both upper and lower extremities leading to amputations of those

parts. The incidence of amputations from burn injury in these 2 patients was 100%. This may be the result of lack of availability of immediate medical attention at the scene of accidents because the burnt patients with epilepsy are usually left alone more, possibly reflecting self seclusion and social and familial negligence and indeference (Kinton and Duncan, 1998).

Burn is a potentially serious cause of morbidity in people with epilepsy. Many patients' seizures remain very difficult to control despite modern drug therapy (Regewa and Tangondl, 1999.

CONCLUSION AND RECOMMENDATION

Therefore prevention measure to help epileptics avoid injury, such as burn injury while cooking at home are extremely important. Improved provision of appropriate care can only be achieved by changing attitudes towards the epileptic disorders, as perceived by the patient themselves, families, medical community and society in general. This requires increased education and publicity. In our environment, women with epilepsy must modify their lifestyles to prevent severe burn injury. They must never be allowed to cook alone without someone beside them. Our people must be educated that epilepsy is not an infectious disease and that it respond to orthodox medications. Both the patients and the care-givers should be made more aware of the importance of compliance in taking anti-epileptic drugs. The importance of compliance to oral medications and more frequent follow-up has to be emphasized to family members.

Finally, to assist in the preventive measures, burn care units in the tertiary health centres should emphasize the importance of multidisciplinary team approach actively involving the Neurologist, Neuropsychiatrist, Pharmacist, Social workers and the hospital management so as to raise warning and better recognize the issue.

REFERENCES

Al-Quattan, M.M., 2000. Burns in epileptics in Saudi Arabia. Burn, 26: 561-563.

Burocal, M., 1997. Burn and epilepsy. Acta Chir Plat, 39: 22-27.

Buck, D., G.A. Baker and A. Jacob, 1997. Patients' experiences of injury as a result of epilepsy. Epilepsia, 38: 439-44.

Danesi, MA., 1982. Knowledge, beliefs and attitude of illiterate Nigerians to epilepsy. Nig. Med. J., 12: 14-16.

Jostv, I.C., V. Naravanan and W.A. Dickson, 2000. Burn wound in patients with epilepsy: Changes in epidemiology and implications for burn treatment and prevention. Epilepsia, 41: 453-456.

Jostv, I.C., W.J. Macron and W.A. Dickson, 2002. Burn Wound Management in patients with epilepsy adopting a multidisciplinary approach. J. Wound Care, 11: 31-34.

Jang, Y.C., Jong W. Lee, K.W. Han and T. Hyung, 2006. Burns in Epilepsy: Seven years of experience from Hallynn Burn Centre in Korea. J. Burn Care Res., 27 (6): 877-881.

Meirelles, R.P.C., N.P. Piccolo, P.P. Piccolo, D.S. Piccolo and R. Piccolo-Daler, 2007. Epileptic burn patient's profile. Prospective and Retrospective study of epileptic patients admitted at pronto socorro para Oueimaduras, Goiania, Brazil. Burn, 33 (1Suppl): 102-103.

Manktelow, A., 2000. Burn injury and management in Liberia. Burn, 26: 561-563.

Kinton, L. and J.S. Duncan, 1998. Frequency, causes and consequences of burn in patients with epilepsy. J. Neurol. Neurosurg. Psychiatr., 65: 404-405.

Regewa, G. and P. Tangondl, 1999. Clinical aspects and biological basis of drug resistance epilepsics. Epilepsy Res., 34: 109-122.

Spitz, M.C., 1992. Severe burns as a consequence of seizures in people with epilepsy. Epilepsia, 33: 103-007.

Zirkin, B.C. and Y. Inoes, 2004. Visual reflex seizures induced by complex stimuli. Epilepsia, 45: 27-29.