

EARLY SEQUENTIAL EXCISION OF CHEMICAL BURNS - OUR EXPERIENCE IN RIYADH BURNS UNIT

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SUMMARY. This paper reports on the treatment of chemical burns in a burns unit in Saudi Arabia in the 10-yr period 1993 to 2003. In 1993, in line with new approaches, the protocol for treating deep chemical burns in the first 48 h was modified to employ sequential excision followed by a second-look approach after 24 h, at which stage autografts/homografts were effected, depending upon the extent of the burn and having ascertained that the wound was bleeding and that there was no necrotic tissue. Results have much improved with this new approach. Three hundred cases of chemical burns are reviewed. Early sequential excision is recommended, followed by immediate grafting within 24 h post-excision.

Introduction

Riyadh is the capital city of the Kingdom of Saudi Arabia, with a population of 5.5 million. Riyadh Medical Complex is the premier tertiary burn centre in the capital, with a burns intensive care ward (bed strength, 12) and a burns ward (bed strength, 6 male beds, 6 female beds, and 2 cradle beds for children).

Chemical burns are common in this country because of the easy availability and use of chemicals in an ever-growing industrialized society. Although over 25,000 chemicals have been identified as causing burns, it is unusual for a surgeon to come across burns due to more than a few chemicals. Generally, three categories of people are involved, viz. people at home, industrial workers, and people involved in chemical warfare. Fortunately the last two groups are rare, while in the home, because of the easy availability of acids and alkalis (used in this country for blocked toilet outlets), such burns are not uncommon. Homicidal chemical burns can occur because of acts of personal revenge.

Material and methods

This is a 10-yr study covering the period from 1993 to 2003. Before 1993 our initial experience of tangential excision and autografting was not encouraging because of gradual graft loss post-operatively. Reports from around the world by Curreri, Moran, and Luterman showed that chemical burns have a continuous tissue-damaging effect due to the chemical. This tissue damage continues, even after the chemical has been washed off or neutralized, until its toxicity is exhausted by reaction with the tissues.

In 1993 we changed our protocol for treating deep chemical burns in the first 48 h, using instead sequential excision followed by a second-look approach after 24 h,

at which stage we apply autografts/homografts depending upon the extent of the burn, having ascertained that the wound is bleeding and there is no necrotic tissue. In cases where there is necrotic tissue, we excise sequentially until a viable wound base is achieved. Our results have much improved with this latter approach.

We admitted and treated 300 patients in the 10-yr period in our centre, with an average of 10 patients per year. Of these, 10 patients (3.3 %) were in the age group < 10 yr, 12 patients (4%) were in the age group 10-20 yr, 46 patients (15.3%) were in the age group 20-30 yr, 150 patients (50%) were in the age group 30-40 yr, 70 patients (23.3%) were in the age group 40-50 yr, and the remaining 12 patients (4%) were over 50.

Out of the total number of 300 patients, 168 (56%) were affected by acids and the remaining 132 (44%) were affected by alkalis; 212 patients were males (70.7%) and 88 were females (29.3%). Both the groups included male and female children.

Accidental burns were the commonest type (256 patients = 85.3%), followed by homicidal burns (32 patients = 10.7%) and suicidal burns (12 patients = 4%).

Discussion and conclusion

Early excision and grafting for some burn wounds were described as early as 1981 by Lustgarten. Cope et al.,¹ in 1947, were the first to report a large series of burn patients treated with excision and skin grafting. They obtained improved survival with this technique amongst the victims of the Coconut Grove nightclub fire, which occurred in 1942. These results were very impressive, considering that in those days there were no effective topical antimicrobials and no systemic antibiotics except penicillin. Blood banking had also not been widely established and intensive care facilities were rudimentary. Despite this and

other scattered reports on the technique, dealing mainly with full-thickness burns, early excision and skin grafting remained in disfavour until 1970.

The credit for re-emphasizing the value of early burn wound excision and immediate closure by autografting goes to Zora Janzekovic.² Although she had published a paper in 1970 on burn wound excision, it was only in 1975 that - as Evans lecturer for the American Burn Association - she once again reviewed her experience. It was then that she also coined the term "early tangential excision" to define the technique of shaving off necrotic dermis in partial-thickness burns until a viable dermal bed is reached, which is immediately autografted.

This was followed by various reports from around the

world, e.g. Burke,^{3,4} Baxter,⁵ Peterson,⁶ Gray,⁷ Heimbach,⁸ Thompson,⁹ Monafa,¹⁰ and Herndon.¹¹

We have been performing tangential excision and immediate autografting since Baxter's visit to our burns unit in 1985.

As is clear from our comparative studies, early sequential excision in chemical burns followed by autografting after a 24-h period has reduced mortality and minimized hospital stay, and therefore also costs.

Even in extensive burns, we have found that early sequential excision with homografts, followed by delayed autografts, has greatly reduced mortality among our patients.

We thus recommend early sequential excision followed by immediate grafting within 24 h post-excision.

RÉSUMÉ. L'Auteur décrit le traitement des brûlures chimiques dans une unité des brûlés en Arabie Saoudite pendant la période 1993/2003. En 1993, conformément aux nouvelles approches, le protocole du traitement des brûlures profondes chimiques pendant les 48 premières h a été modifié pour employer l'excision séquentielle suivie par un deuxième contrôle après 24 h; à ce point les autogreffes/homogreffes sont effectuées selon l'extension de la brûlure et après avoir vérifié que la lésion continue à saigner et qu'il n'y a pas de tissu nécrotique. Cette nouvelle approche a permis une importante amélioration des résultats. Trois cents cas de brûlures chimiques sont considérés. L'excision séquentielle précoce est recommandée, suivie par la greffe immédiate avant 24 h après l'excision.

BIBLIOGRAPHY

1. Cope O., Langhor J., Moore F.D. et al.: Expeditious care of full-thickness burn wounds by surgical excision and grafting. *Ann. Surg.*, 125: 1, 1947.
2. Janzekovic Z.: A new concept in the early excision and immediate grafting of burns. *J. Trauma*, 10: 1103, 1970.
3. Burke J.F., Quinby W.C., Bondoc O.C.: Primary burn excision and immediate grafting, a method shortening illness. *J. Trauma*, 14: 389, 1974.
4. Burke J.F., Quinby W.C., Bondoc O.C.: Primary excision and prompt grafting as routine therapy for treatment of thermal burns in children. *Surg. Clin. North Am.* 56: 477, 1976.
5. Baxter C.R.: Early surgical excision and immediate grafting. In: "Burns: A Team Approach", Artz C.P., Moncrief J.A., Pruitt B.A. (eds), W.B. Saunders, Philadelphia, 1979.
6. Peterson H.D.: Tangential excision. In: "Burns: A Team Approach", Artz C.P., Moncrief J.A., Pruitt B.A. (eds), W.B. Saunders, Philadelphia, 1979.
7. Gray D.T., Pine R.W., Harnar T.J. et al.: Early excision versus conventional therapy in patients with 20 to 40% burns. *Am. J. Surg.*, 144: 76, 1982.
8. Heimbach D.M.: Early burn excision and grafting. *Surg. Clin. North Am.*, 67: 93, 1987.
9. Thompson P., Herndon D.N., Abston S. et al.: Effect of early excision on patients with major thermal injury. *J. Trauma*, 27: 205, 1987.
10. Monafa W.M., Bessey P.Q.: Benefits and limitations of burn wound excision. *World J. Surg.*, 16: 37, 1992.
11. Herndon D.N., Thompson H.K., Rutan R.L.: Burn excision. In: "Progress in Trauma and Critical Care Surgery", 419, Najarian J.S., Delaney J.P. (eds), Mosby Year Book Publ., St. Louis, 1992.

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ERRATA CORRIGE

With reference to the article THE TREATMENT OF LYELL'S SYNDROME: OUR EXPERIENCE (Napoli B., D'Arpa N., Masellis M.) published in *Annals of Burns and Fire Disasters*, vol. XIX, no. 1, March 2006, we wish to make two corrections in the text. These are on p. 33, **Table I**, last line: Al-Mutairi, year 2004, not 200; p. 34, **Table III**, last line: Age (yr), 38, not 8.

We apologize to the authors and to our readers for these oversights.

The Editors