





دکتر محمد باقر حیدری

فوق تخصص
جراح پلاستیک

دانشیار و عضو هیأت علمی دانشگاه علوم پزشکی کرمانشاه
عضو انجمن جراحان پلاستیک و زیبایی ایران

management of burn and electrical trauma

Epidemiology

Burn trauma incidence has a cyclical pattern with the peak incidence during holidays and vacations. According to the most recent statistics compiled by the World Health Organization and the World Fire Statistics Center (WFSC), fire cause roughly 6.6 million major burn injuries and 400 000 deaths every year.¹ In economically developed nations, 1–2% of the population receives a burn injury annually and 10% of those require professional medical attention. Roughly 10% of those requiring medical attention have major burns that require burn center management. Major burn trauma is a disease of the poor and disabled, as the majority of cases occur in poor neighborhoods and in low-income countries where prevention programs are almost nonexistent. A practical indication of fire mortality risk is the international median death rate which is 0.9–1.2 per 100 000 inhabitants by country. In addition, the cost to society in terms of lost wages, acute medical care, and rehabilitation is enormous. In 2009, the WFSC noted that the cost of direct fire losses ranged from 0.06–0.26% of countries' gross domestic product (GDP) and the cost of indirect fire losses ranged from 0.002–0.95% of countries' GDP.

Risk factors

In addition to poverty, major burns are more common in populations that have some predisposing factor such as mental illness and substance abuse. For adults, predisposing factors to burns include alcoholism, senility, psychiatric disorders, and neurological disease such as epilepsy.² Children under 5 years old are also particularly vulnerable to burns. Among all children, scald burns account for about two-thirds of burn injuries. For children less than 5 years of age, they account for 75% of all pediatric burns.

جدول ۱-۱: درصد موارد «خودسوزی» در میان موارد «خودکشی» در چند کشور که به مرگ منجر نشده اند

محل انجام مطالعه	درصد
ایران (همدان)	۱/۳۹
کره جنوبی (سئول)	۱/۸
اسرائیل (جمعیت یهودیان)	۸/۵
ایران (اسلام آباد غرب)	۹/۵

جدول ۲ - ۱ منجر به مرگ در چند کشور (منابع « خودکشی « در میان موارد « خودسوزی » : درصد موارد ۱ ، ۷ و ۸

درصد	محل انجام مطالعه
۰/۰۶	ایتالیا (رم)
۰/۸	ایتالیا (میلان)
۳/۷	یونان
۰/۷۶	آلمان (برلین)
۰/۹۶	آمریکا (میامی، فلوریدا)
۱	کانادا (اونتاریو)
۷/۹	هند
۹/۹	آفریقای جنوبی (دوربان)
۱۴/۵	اسرائیل (یهودیان)
۲۱	هند (کاراکا، مانپیل)
۲۵	ایران (تهران)
۳۵/۳	ایران (تهران، روستاهای اطراف)
۳۶/۴	ایران (میانگین ۱۸ استان)
۳۹/۸	هند (دهلی)
۴۰/۳	ایران (خراسان)
۴۱	ایران (کرمانشاه)
۴۹	ایران (اهواز، در گروه سنی ۲۰-۱۱ سال)
۷۱	ایران (ایلام)

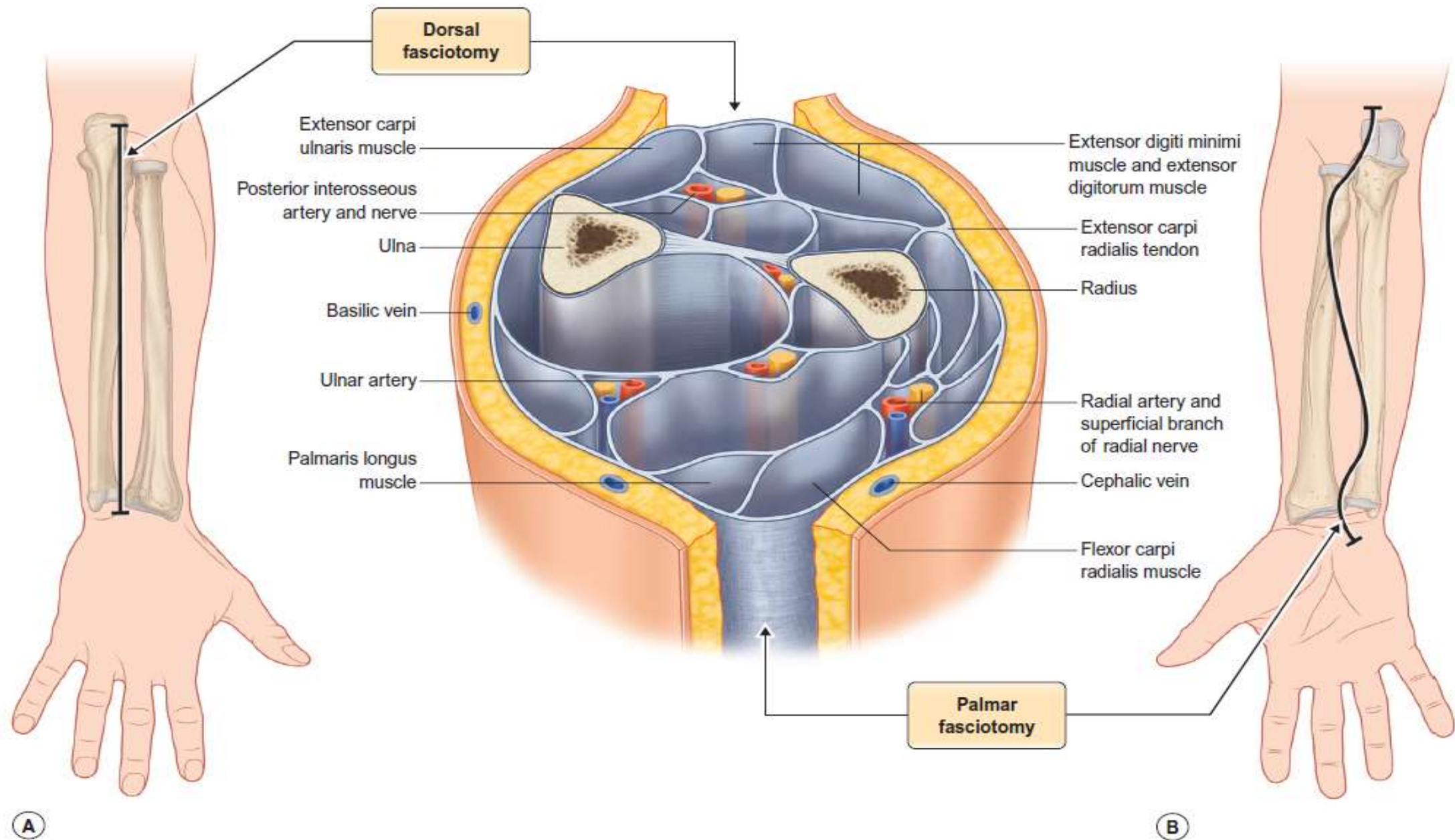
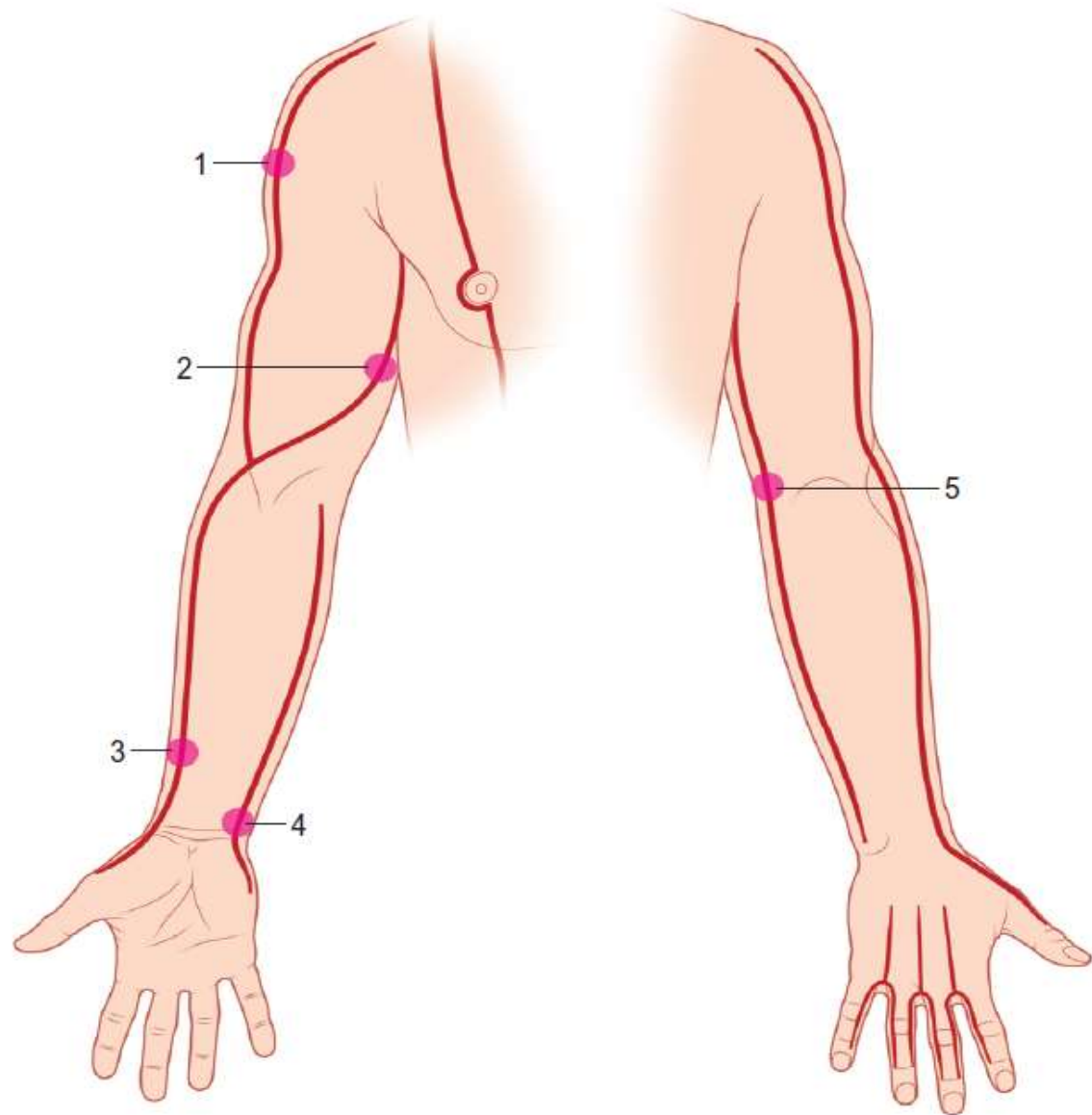


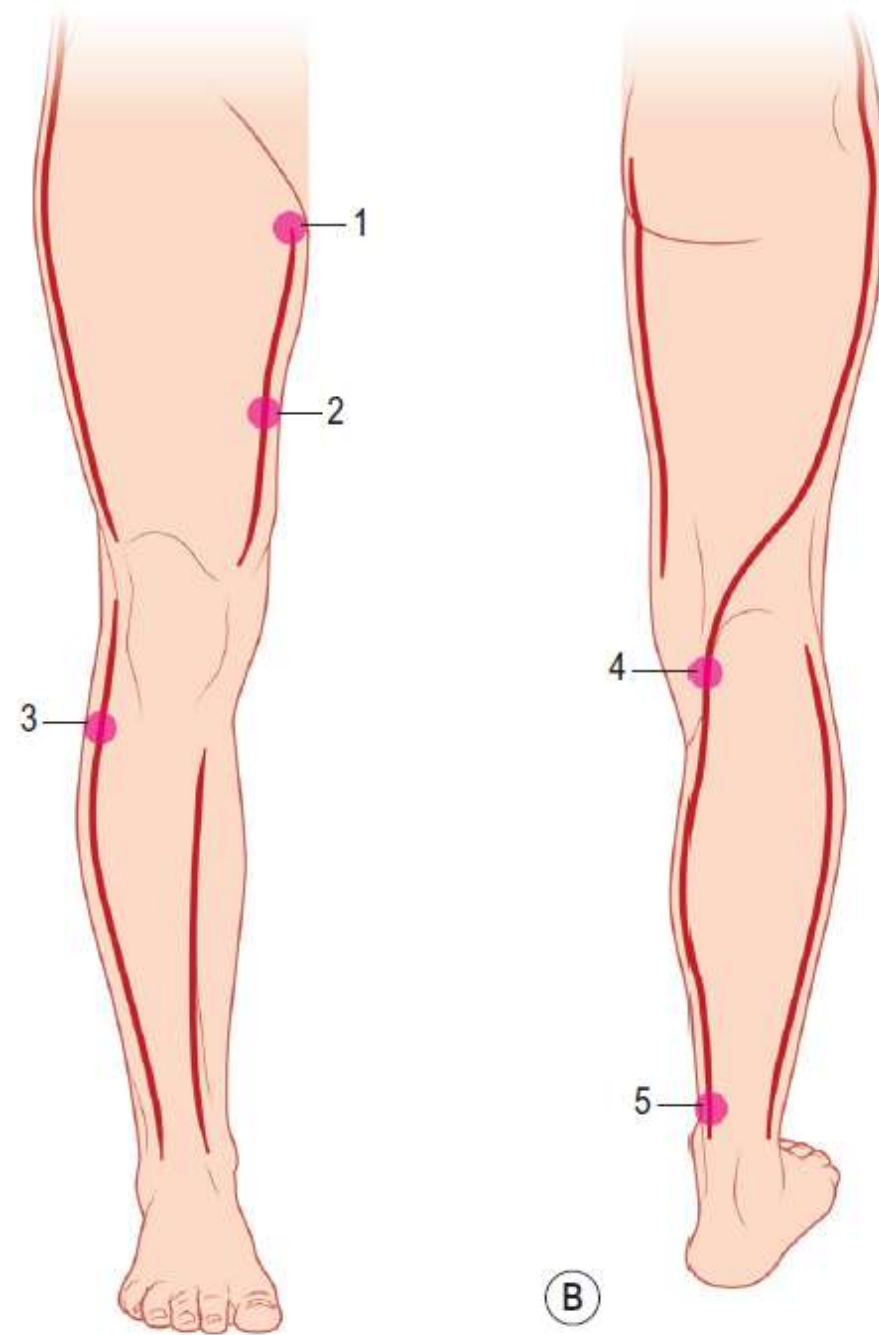
Fig. 19.1 Anatomy of forearm escharotomy incisions.



(A)

(B)

Fig. 19.2 Recommended sites for upper extremity and chest escharotomies. Numbers 1 to 5 indicate dangerous incision sites.



(A)

(B)

Fig. 19.3 Recommended sites for lower extremity escharotomies. Numbers 1 to 5 indicate dangerous incision sites.

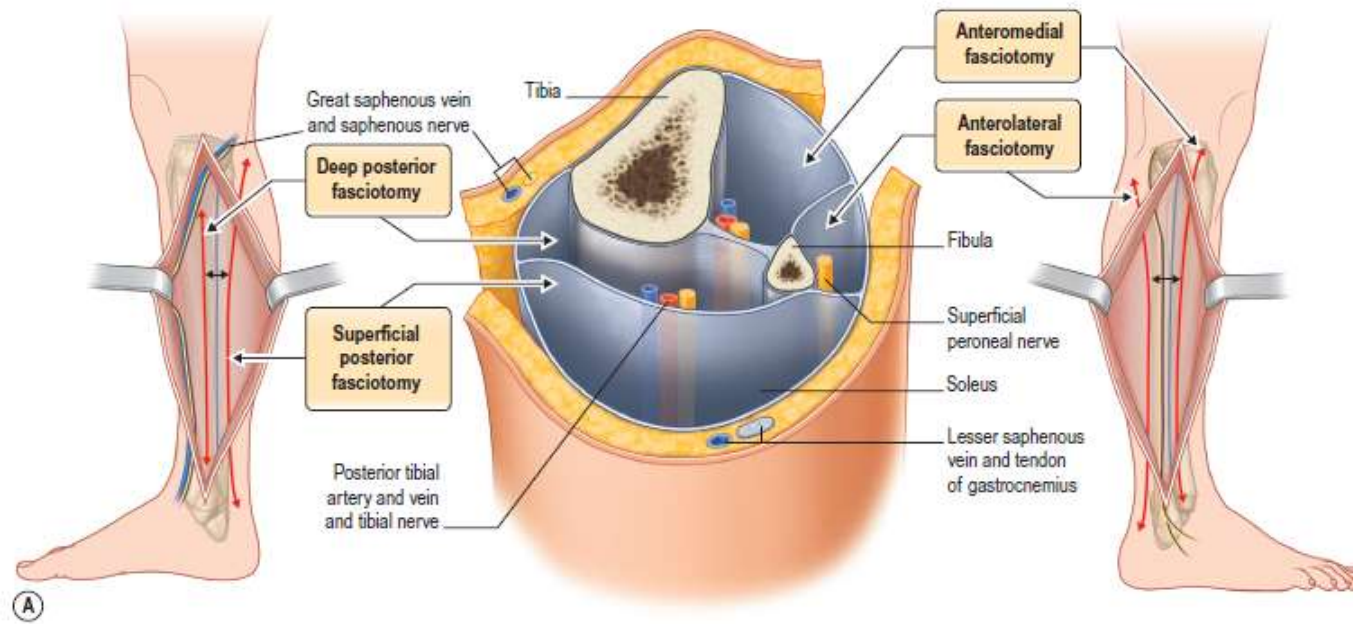


Fig. 19.4 (A) Anatomy of lower extremity escharotomy and fasciotomy incisions. (B) Schematic of fascial release after escharotomy in the lower extremity.



Fig. 19.5 Upper extremity escharotomy and fasciotomy.



Fig. 19.7 (A) Admission, 4 hours post-injury, burns diagnosed as full-thickness, compartment interstitial pressure measured 80 mmHg. NexoBrid enzymatic dressing applied. **(B)** Immediately after removal of NexoBrid enzymatic dressing: pressure reduced to 20 mmHg, eschar wiped away revealing viable deep dermis. (*With the courtesy of Prof Lior Rosenberg.*)



Fig. 19.6 Lower extremity escharotomy.

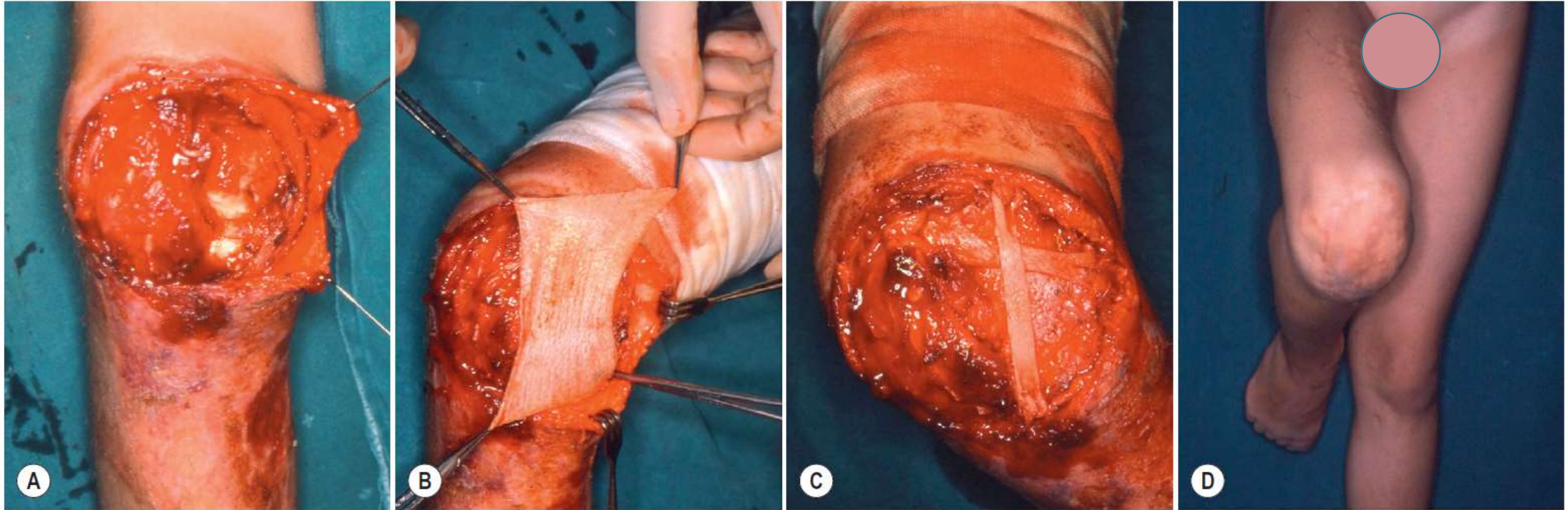


Fig. 19.8 (A) Knee joint space exposed secondary to high-voltage electrical burn. (B) Dermis harvested for joint reconstruction. (C) Dermal grafts incorporated into joint capsule reconstruction. (D) Result after skin graft.



Fig. 19.10 Specialized compression garment.

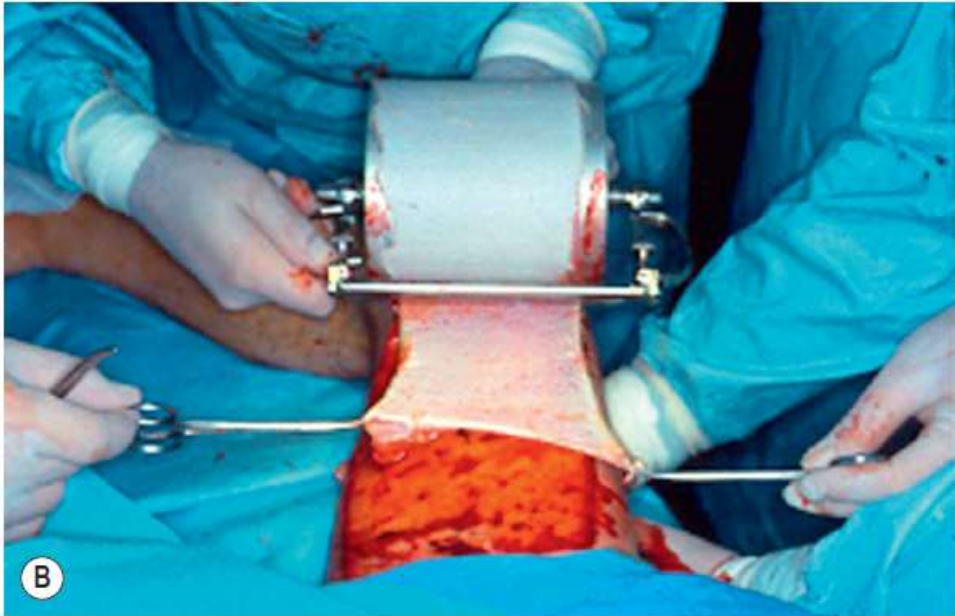
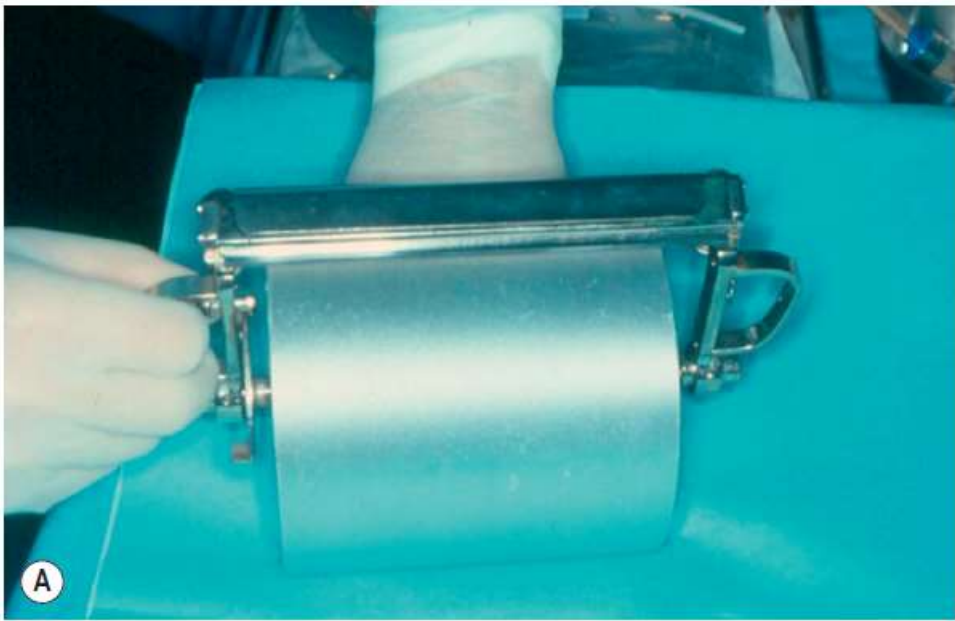


Fig. 19.9 (A) The Padgett dermatome. **(B)** Dermal harvest with the Padgett dermatome. Epidermal layer is adherent to the dermatome drum.

Postoperative care

Burn injuries cause highly scar-related disabilities characterized by major hyperplasia and marked contraction of the skin surface. The mobile segments of the extremities (axilla, elbow, wrist, knee, ankle) are among the most critical for monitoring in the post-surgical phase (Figs. 19.10 & 19.11; Table 19.1).

Many studies have dealt with the actual effectiveness of post-surgical elastic compression and massage therapy, and in normal clinical practice these procedures are routinely performed to obtain the best results possible in terms of scarring, range of motion (ROM), and function. The use of elastic pressure garments for the extremities, silicone sheets or gel, and splints are widely recommended from the earliest post-operative stage in all centers specializing in burns treatment. In addition to these devices, it is always advisable to perform



Fig. 19.11 Physical/occupational tasks to enhance post-burn mobility and minimize contracture formation.

Table 19.1 Joint position

Joint	Position
Shoulder	Abduction 65–85° Slight flexion 25°
Elbow	Extension
Wrist	Slight extension 30°
Hip	Extension Abduction 15°
Knee	Extension
Ankle	Maintain 90°



Fig. 19.12 Axillary contracture (A) before and (B) after Z-plasty release. (Courtesy of Department of Plastic Surgery and Burn Therapy, ARNAS Ospedale Civico, Palermo, Italy.)



Fig. 19.13 (A) Severe ankle contracture. (B) Ankle contracture from Fig. 19.17, treated with multiple Z-plasties.

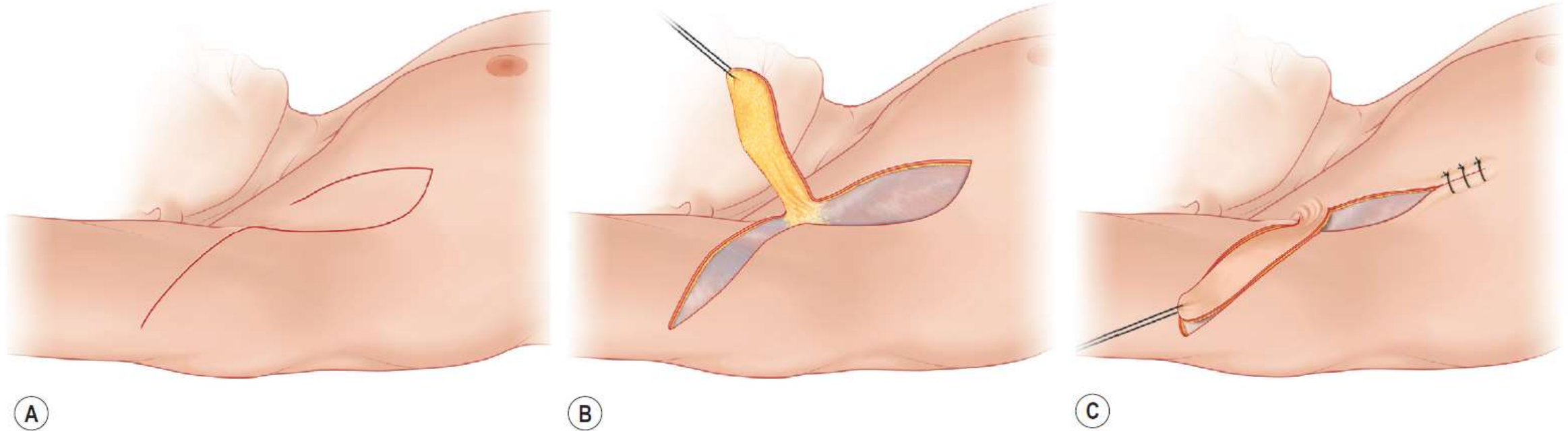
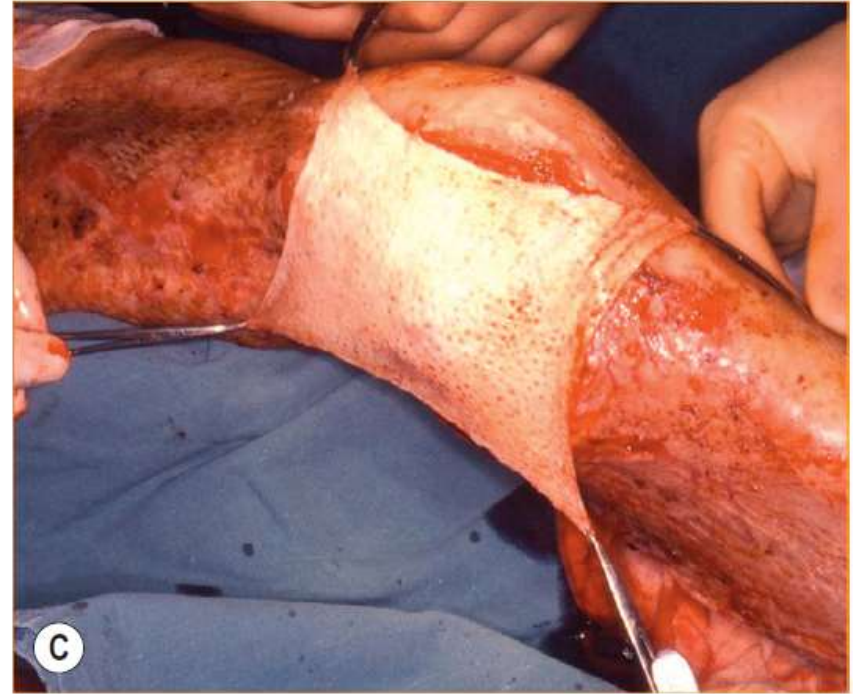
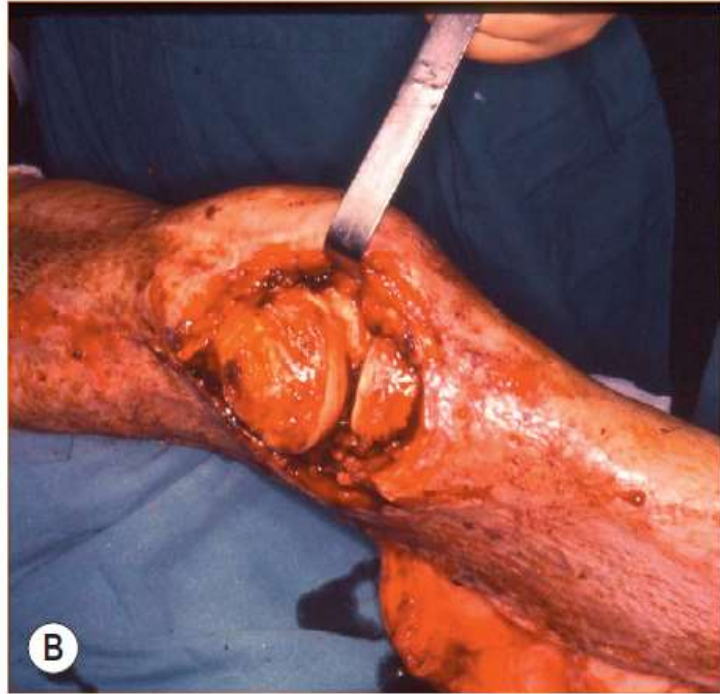
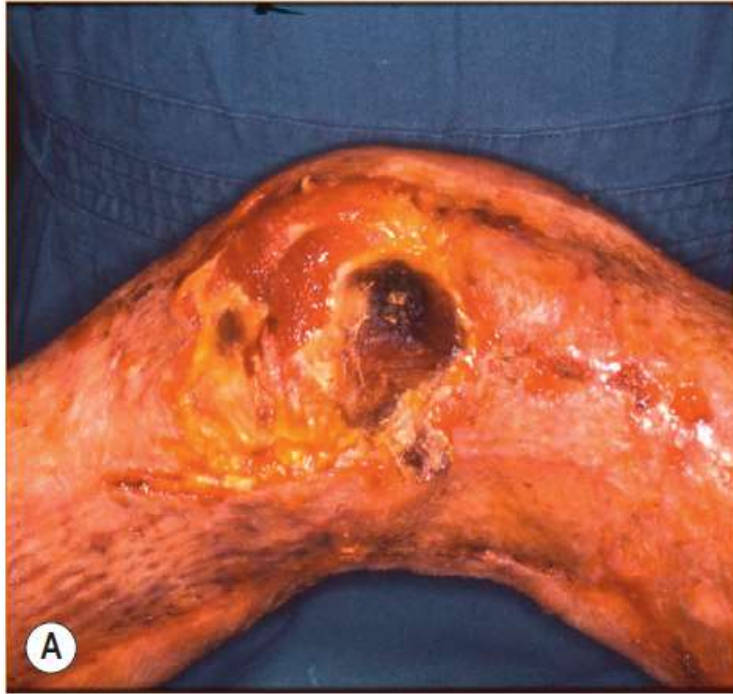


Fig. 19.14 (A) Designing a $\frac{3}{4}$ Z-plasty for the treatment of an axillary contracture. (B,C) Raising the flaps of the $\frac{3}{4}$ Z-plasty designed in Fig. 19.19.





Fig. 19.15 (A,B) Severe retraction of axilla hollows. (C) Multiple Z-plasty plan. (D) Final result after 2 months. (Courtesy of the International Association of Humanitarian Medicine.)



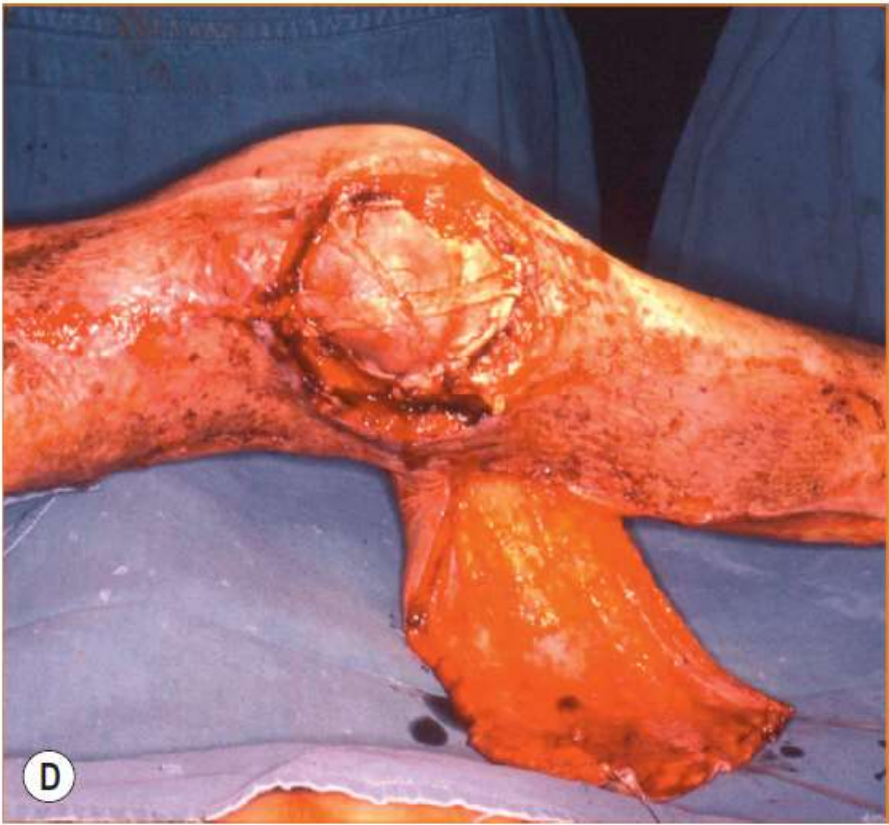


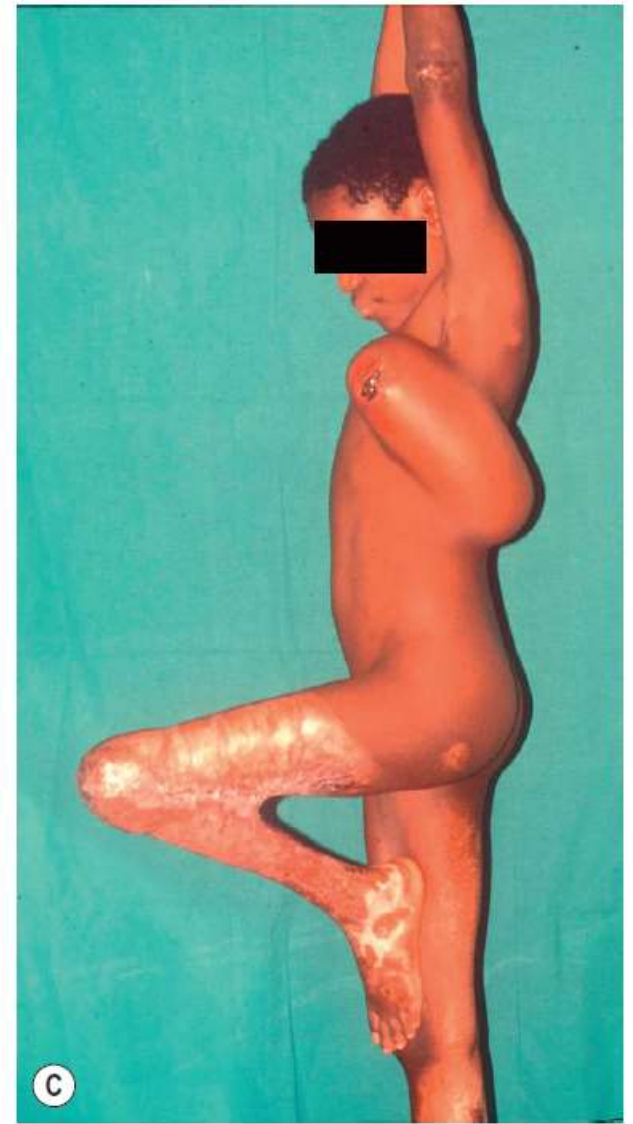
Fig. 19.16 (A) Bone exposed secondary to severe burn. (B) Exposed knee joint. (C) Dermal graft for coverage of exposed knee joint. (D) Dermal grafts in place reconstructing joint capsule; fasciocutaneous flap has been raised. (E) Fasciocutaneous flap inset to provide definitive joint coverage superficial to dermal graft. (F) Final result of knee reconstruction.



Fig. 19.17 (A) Severe axillary contracture. **(B)** Axillary release and reconstruction with locoregional flaps.



Fig. 19.18 (A) This case illustrates the painful after-burn scar strongly adherent to the joint. (B) The use of skin expansion of the lower medial thigh region. (C) The result of the use of skin expansion of lower medial thigh region, for an after-burn scar.



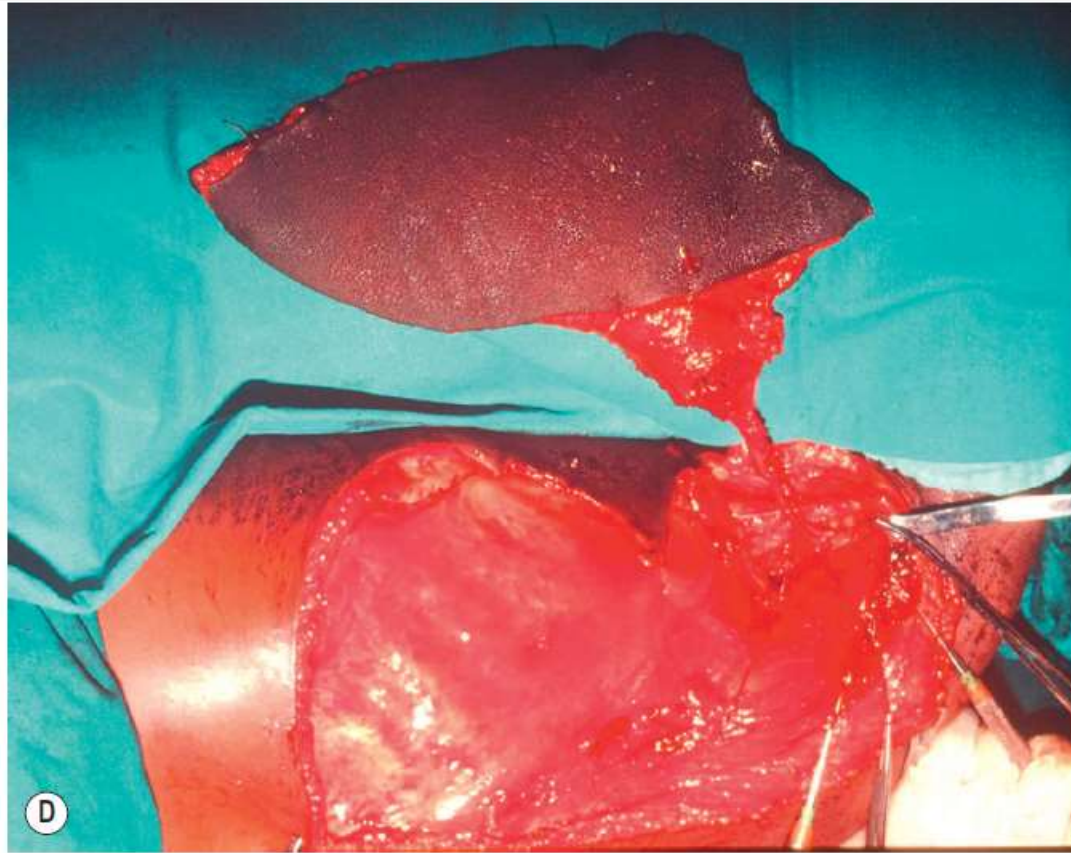


Fig. 19.19 (A) Knee: severe retraction. (B) Donor area. (C) Expansion of latissimus dorsi flap. (D) Microsurgical session. (E) Free pre-expanded flap. (F) Result.

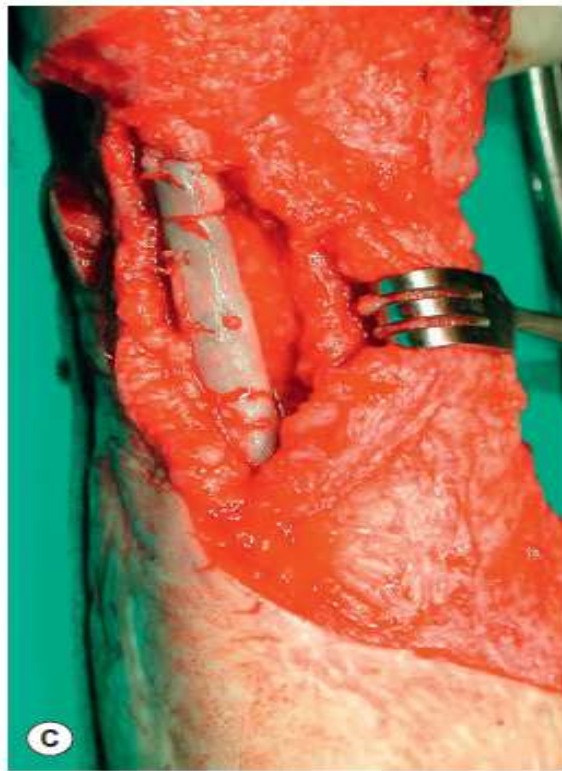
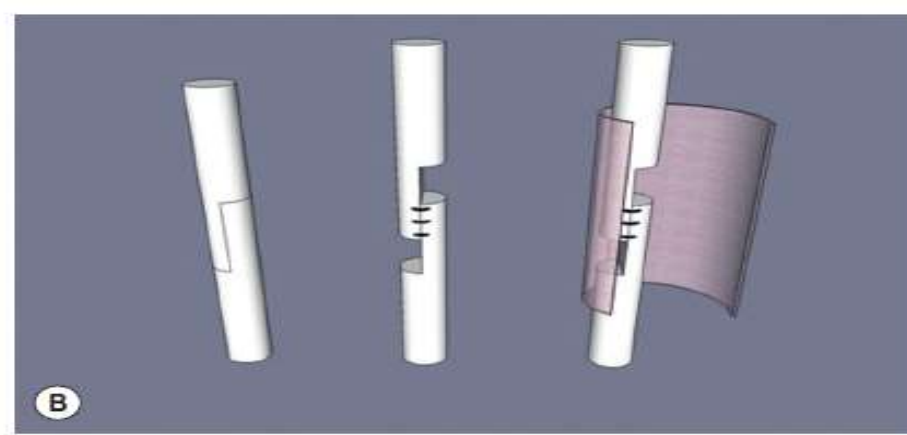



Fig. 19.20 (A) Scar contracture about ankle leading to imbalances in the underlying tendons. (B) Lengthening design and dermal patch. (C) Tendon lengthened and reinforced by dermal patch. (D) Resurfaced ankle after underlying tendons have been rebalanced. (E) Postoperative result after tendon rebalancing and ankle resurfacing. (Courtesy of the Department of Plastic Surgery and Burn Therapy, ARNAS Ospedale Civico, Palermo, Italy.)



Fig. 19.21 Elbow area before **(A)** and after **(B)** 6 treatments with non-ablative fractional laser. Better color matching and more quality of skin texture.

Table 19.3 Laser in scar treatment

Nd:YAG 1064	Scars immature, with vessels
IPL	Hyperpigmentation Scar with vessels
Fractional laser Ablative Non-ablative	Mature scars with heterogeneous surface Mature scars, fibrotic, thick

A white rectangular card is placed on top of a red envelope. The card has the words "Thank you..." written in a black, cursive script. The envelope is partially open, showing its red interior. The entire scene is set against a light gray background.

Thank you...