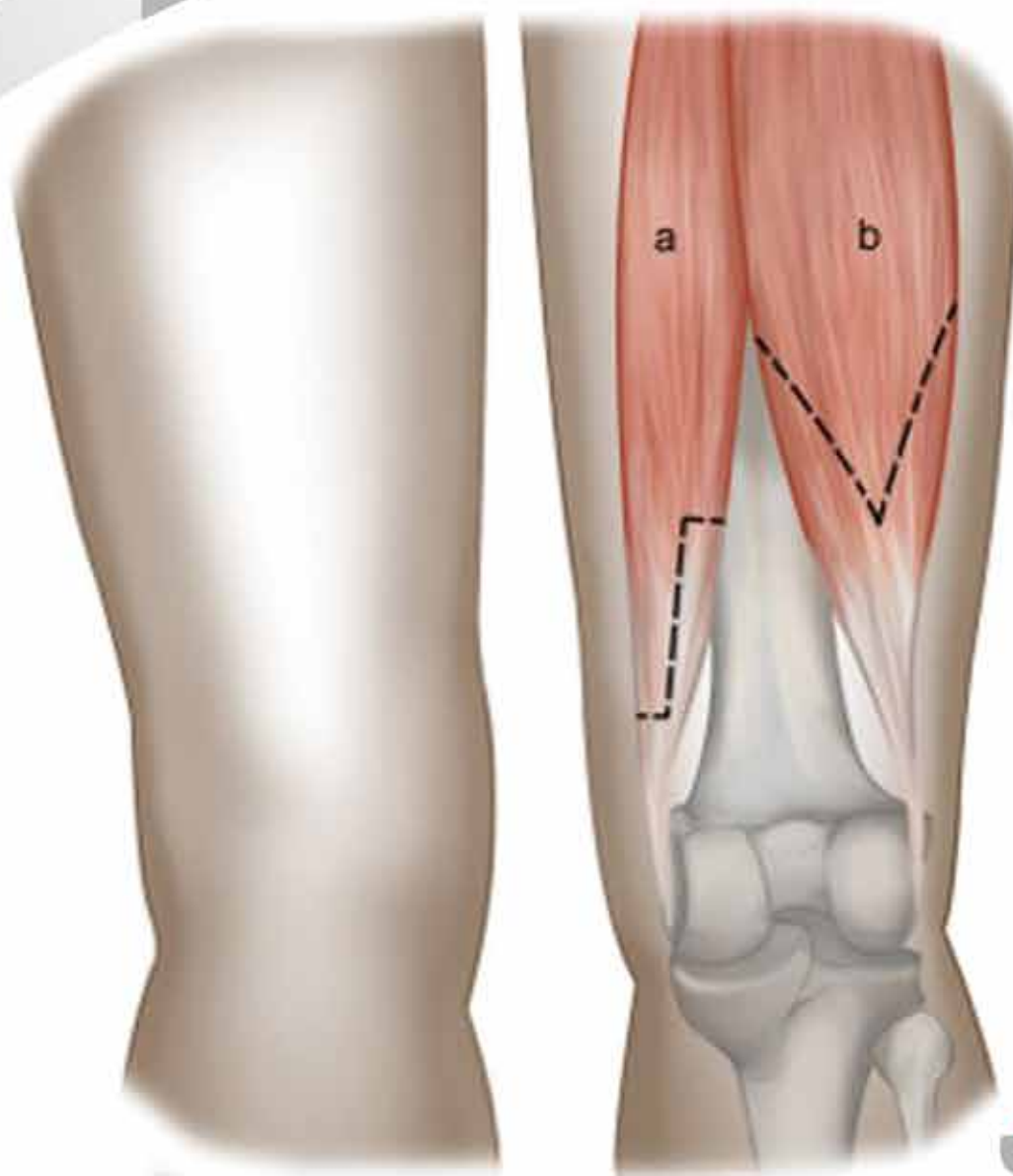


2ND
CHANCE

Severe contractures management

Basic principles

VOLUME I
Revised edition



 ergon

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Severe skin contractures management

Basic principles

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The authors and 2nd change organization, would like to recognize from these pages, the valuable cooperation, contribution and efforts made by those african surgeons which have been organize the different workshops along these years.

Without them, the teaching objectives that this book intends to cover would surely not be reached.

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PROLOGUE

Burns continue to be a significant and unmet public health problem in the developing world and especially in sub-Saharan Africa where there are few burn specialists or dedicated burn centers. The cost of acute burn care is significant and the patients that live are often left with major scars and skin contractures that limit normal function and often prevent a normal life style.

This volume offers a paradigm shift in the evaluation and treatment of burn contractures. A useful new classification of burn contractures, MASCC or Morphological African Skin Contracture Classification is presented. This practical classification will be used in the future to classify the multiplicity of burn contractures. In addition, a useful algorithm is given for the management of contractures based on this classification.

This is the first time the average surgeon in developing countries has been able to match treatment with an accurate classification of a burn contracture. The surgeon is given many options for treatment. Therefore the surgeon can match his abilities with the needed reconstruction.

This volume offers hope to those caring for these patients who suffer not only from their appearance but also from their inability to be productive in their society.

Since severe burn contractures are infrequent in Developed Countries, there is little written on their treatment that is applicable in low resource locations where there is a lack of basic supplies and equipment. Much is written on prevention of these unsightly complications of burns, but this information is difficult to put into practice in situations where the patient arrives days, weeks or even months after the original burn.

In addition, this volume not only covers burn contractures but the basic science of wound care, skin grafting, flaps, anesthesia, and surgical techniques –in other words from the patient's initial presentation until discharge. When a surgeon is fortunate to possess this comprehensive.

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EDITORIAL

The major difference between countries with systems that provide some, albeit limited, primary attention and those that don't provide any is that in the former, patients with burns are adequately treated from the very first moment. This allows one to stabilize the general conditions, diminish pain, facilitate rehabilitation and avoid secondary deformities. Meanwhile, in developing areas post-burn treatment is usually performed at home with poor, if any, qualified management. This results in a poor survival rate and secondary wound healing in the less painful but vicious positions. This leads to severe contractures at different levels. Very few specialized burn units exist in general hospitals and have access to very limited resources. This also contributes to the poor or limited outcomes. This fate is common to many wounds involving minor to wider areas of skin.

Once again, the management of secondary deformities and contractures varies greatly from specialized services in developed countries to those of developing ones.

Thus, the aim should be to provide local surgeons and physicians with the adequate tools to treat challenges in their local settings. It means that specialized books should be written based on local experience applied to the environmental conditions and settings, with the instruments and tools normally found in developing regions. Many procedures that are described as routine in developed countries cannot be applied in developing ones. Advanced microsurgical procedures that allow for free

transfer, perforator flaps or "superthin flaps" are techniques beyond the capacities of the average plastic surgeon, even more so from the standards in developing countries, where few, if any, plastic surgeons can be found. Hence, these procedures will only be mentioned here and not fully treated or explained. Even full thickness skin grafts perfectly applied over joints completely released from scars and fibrous tissue are possible surgical treatments. The almost forgotten cross-flaps and tube flaps are still extremely useful for surgeons who are being initiated into the field of plastic surgery. Excellent reconstructions have been performed using these types of flaps. They constitute a real "starting point" for surgeons who are being initiated into the field of plastic surgery.

This book was written with this particular objective in mind. It aims not only to provide local general surgeons with the most accurate description of procedures to treat concrete defects or contractures, but also to offer young surgeons working in cooperative programs surgical techniques that have been proven effective in settings with limited resources, in order to allow them to treat deformities they have never seen in their countries of origin.

Meeting after meeting, book after book, the most modern techniques and procedures are described and the most precise instruments and devices become available to surgeons in developing countries. Research and teaching tend to emphasize the new trends. Furthermore, the great advances in anaesthesiology and intensive care

units play a very active role in the favourable outcome of our patients. Meeting after meeting and book after book, the gap between developed countries and developing ones is increased.

Excellent (and very expensive) publications from highly recognised specialists, full of illustrations about techniques and materials that rarely, if ever, fit the requirements of developing, are of little use in these regions even when available for local surgeons.

This manual represents the wide experience in the treatment of a vast number of forms of post-burn contractures throughout many developing countries, with tools available in these areas, the surgical procedures and the post-operative management. It also includes a new classification for skin scar post-burn contractures developed by the authors. It intends to be a useful book, with practical resources, that will assist local surgeons, as well as young first world surgeons in their solitude

when dealing with formidable challenges in settings with limited resources.

Volume I introduces surgeons to the principles of wound healing and the consequences of badly or poorly managed wounds like burns, the new classification, the general principles about vascularization of the skin, integuments and especially an introduction to the basics of grafts and flaps, how they should be raised, inset and managed.

Cooperation does not only mean to assist the local population, it should extend further. For years it has been our aim to spread the knowledge of our specialty amongst all surgeons, physicians and even paramedics.

Finally, we have to recognise the precious help of Jordi Grifoll, his help rendered possible the first edition of this book that finally resulted in the second.

Alberto Musolas

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INTRODUCTION

Major burns are amongst the worst injuries that a person may suffer with devastating functional, as well as aesthetic effects. Even treated in the best-specialized units of the most developed countries, the aesthetic and functional outcomes following major burn injuries are disappointing. Long periods of rehabilitation and many secondary procedures and revisions are generally needed. In developing countries, patients with extensive major burn injuries, simply die, and amongst those who survive, almost 100% present some sort of major secondary contracture. The same fate, although less frequent, results for those who suffer from different forms of severe traumatism, not properly managed or not treated at all, or from those who suffer the devastating effects of gangrene infections, such as Noma or snake bites.

Burns do not need to be extensive to cause significant aesthetic deformities or functional disabilities. Even a small burn poorly managed over an eyelid, oral commissure or over a single finger can be highly troublesome.

There are mainly three consequences of poorly or badly managed burns:

- Aesthetic problems (main concern in developed countries)
- Functional limitations (main concern in developing countries)
- Degenerative carcinomas from ulcerated scars that last as long as 15 to 20 years (rare but equally seen in both areas).

In western countries, appropriate care immediately after the injury under generally well-established protocols results in outcomes that are good or at least acceptable, especially from a functional aspect. In these countries, great adhesions or contractures are rarely seen, most secondary problems relate to aesthetic issues. Colour patches, small adhesions, hypertrophic and badly suited scars are the most common secondary problems that need revision.

Regarding the treatment of secondary defects, one of the great differences between developed and developing countries is the availability of technical and material resources such as tissue expanders and access to microsurgical procedures. Tissue expanders are usually the first choice when replacing grafts or scars from a burned area with normal and healthy skin from the outskirts of the scar. Tissue expanders are expensive and rarely available in developing countries, require close control and specialized surgeons to progressively inflate and check them. Microsurgical procedures are also rarely available in developing countries. These techniques not only need highly specialised surgeons but also a great investment in material resources (microscopes) and specifically trained nurses.

Local and cooperating surgeons from abroad have to deal and work with limited resources available in developing settings. Fancy procedures such as the use of multiple tissue expanders placed around the body or magni-

ficent free flaps are simply unthinkable in local hospitals in developing countries.

Being realistic, in settings with limited resources, technical options are also limited for surgeons. Skin grafts, used only when it is clear how to manage them and how to manage the recipient area, are still an option (and in fact can be an excellent one in selected patients as we will see later in this book). Perforator flaps are realistic options depending on the circumstances (availability of post-operative control), fasciocutaneous flaps, local random flaps and cross-flaps (no longer seen in western countries) are considered a realistic choice.

As aesthetic problems are the main concerns in developed regions, in developing countries although aesthetics are important, the primary objective of surgery aims to avoid functional impairment. Primary care is nearly inexistent in developing countries, while most of the patients will heal at home. Generally, the most comfortable and least painful posture is hyperflexion of the joints. This is the position adopted for the majority of pa-

tients. Furthermore, the burned surfaces are usually not independently dressed and properly isolated. This will finally result in adhesions, deformations and contractures. All cause different degrees of impairment.

Treatment of great defects (contractures) has evolved over the last few decades from initial random flaps to bulky musculocutaneous flaps to thin and well-defined axial fasciocutaneous or perforator flaps. During the last few years, many precise and complex perforator flaps have been described opening the way for **high quality one stage surgery**.

However, the best way to avoid secondary contractures is prevention. Unfortunately, until primary care is universally available, surgeons will need to learn how to deal with skin contractures using simple techniques with limited or very limited resources.

In the following chapters, the basis of wound healing and classification, principles and techniques to release and repair post-burn skin contractures defects using grafts and mainly with flaps will be described.