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RESEARCH ARTICLE

REHABILITATION OF BURN VICTIMS IN THE ACUTE PHASE

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Abstract

In the management of burns, the role of rehabilitation is essential, the rehabilitation program aims to obtain an orthopedic, functional, aesthetic and psychological state as close as possible to the previous state. It must prevent hypertrophic scars and retractions, reduce stiffness and deformities to a minimum, promote healing and maximize functional capacities. The techniques applied throughout the stages of care are complementary. They will combine, to varying degrees, immobilization, postural installation, skin stretching, equipment, physical therapy and compression. The cooperation of the patient is essential; it requires the therapists to take into account all the problems and difficulties encountered by the patient, whether they are physical, psychological, socio-familial or professional. The aim of this work is to emphasize the importance of functional rehabilitation in the therapeutic management of burned patients by allowing them a rapid social and professional reintegration.

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Introduction:-

Burns are considered to be extremely frequent traumas of different aetiologies, thermal, electrical and chemical, which in their minor versions are part of everyday accidents.

These injuries lead to significant physical and psychological complications that require multidisciplinary rehabilitation to prevent long-term problems related to scarring, contractures and other problems that limit physical function.

Rehabilitation, to be effective, must be early, and depends on the severity of the burn, itself determined essentially by the depth and surface of the initial lesions and the precocity of obtaining epidermalization or surgical skin coverage, and must be based on three main objectives: prevention of complications of bed rest, protection of the osteoarticular and tendomuscular function of the burned segments and preparation for autonomy.

Patients and Methods:-

Our study is retrospective and collected 45 patients hospitalized for burns in the reconstructive surgery and burns department of the Military Hospital of Instruction Mohammed V in Rabat, over a period of 4 years, between July 2018 and July 2022, and who received rehabilitation in the acute phase.

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There was no limit to the extent or agent of the burns.

We excluded patients who died during their hospitalization, and patients lost to follow-up after discharge, as well as patients with first degree burns.

Results:-

45 patients were included in our study, 26 males and 19 females, the age of the patients ranged from 21 to 79 years with an average of 49 years.

The aetiology of the burn was thermal in 34 patients, of which 24 patients were burned by hot liquid projection, 9 patients by flame, one patient was victim of a mine explosion. A chemical origin was the cause of burn in 6 patients, and 5 patients were victims of an electrical burn.

The burned area varied between 9% and 63% according to Wallace's rule, with an average of 20% between superficial 2nd degree, deep and 3rd degree: 25 patients had deep 2nd degree burns, 6 patients had 3rd degree burns and the remaining patients had mosaic burns.

The location of the burns was mainly in the limbs: the upper limb in 10 patients, of which two patients had damage to both upper limbs, with involvement of the joints (elbow and wrist) in the majority of patients (8), and 4 patients had injury to the hands, 15 patients had burns of the lower limb, the foot was affected in 10 patients, the leg in 8 patients, the thighs in 3 patients, with joint involvement in 8 patients, the burn was located on the trunk in 5 patients, 3 patients had burns on the face and neck, and one patient on the external genitalia. 11 patients had multiple locations including at least one involving the upper (5 patients) or lower (6 patients) limbs.

Six patients required a stay in intensive care, the length of stay varied between 5 days and 31 days. All patients received biological check-ups and daily care with silver sulfadiazine.

32 patients were treated surgically with excision and grafting, between 5th and 10th day post-burn.

All patients benefited from early rehabilitation, starting on day 2, provided by the department's physiotherapist team, in coordination with the department's doctors, with the aim of preserving and restoring the patient's functional potential, this rehabilitation was based on passive mobility at first, then active mobility with assistance or low resistance, in order to target purely articular levels but also passive (capsulo-ligamentary) or active (tendinomuscular and proprioceptive) periarticular axes, by adapting the orthopaedic techniques to the specificities of the burn victim.

In the orthopaedic component, 26 patients regained at least 80% mobility, joint stiffness was seen in 12 patients, involving the elbow in 3 patients, the hand joints in 3 patients, the knee in 4 patients, and the foot in 2 patients. 5 patients retained ankylosis, and paraosteoarthritis was seen in 2 cases.

As far as scar rehabilitation is concerned, patients have benefited from preventive and curative rehabilitation, in order to manage the intrinsic constraints developed by the dermal remodelling mechanisms, as well as the extrinsic constraints imposed on the scar tissue by the patient's daily or rehabilitative activity. Thus, it must be complementary to surgery, aiming to maintain the patient's functional capital while optimising the consolidation of the aesthetic result as much as possible.

22 patients retained a post burn contracture, 4 at the knee, 3 at the axilla, 4 at the elbows, 4 at the fingers, 2 at the toes, 3 patients retained a post burn contracture at the neck and one patient at the inguinal fold.

Discussion:-

Burn injuries are devastating and complex, causing significant physical, emotional, and functional impairments. Functional rehabilitation plays a crucial role in optimizing the recovery of burn patients during the acute phase of their injury. By focusing on early intervention, comprehensive assessment, and targeted therapies, functional rehabilitation aims to minimize complications, promote wound healing, and restore function to affected areas.

The principles of rehabilitation for burn victims vary according to the severity of the burn, the associated lesions, the complications, the stage of development and the functional state of the patient. They are first of all preventive and are based on :

1. Acquisition of wound healing facilitated by immobilisation
2. Avoidance of retraction and hypertrophy: The lesion site is oriented in the direction of maximum skin stretch and compressed in the early stages by static and alternating segmental fixations. The lower the patient's compliance and/or the higher the risk of relapse, the longer the postural stability. [6,7,8]
3. Limitation of rigidity: This is ensured in the acute phase by alternating the posture of the injured area according to a reversed skin chain, allowing maximum joint mobility, then assisted active mobilisation and finally purely active mobilisation as quickly as possible.[8,9]
4. Acquisition of psychological self-support.

Several rehabilitation techniques can be used in the acute phase of burns to promote healing and restore function. These techniques include:

Range of motion exercises:

Range of motion exercises are designed to promote movement and flexibility in the affected area. These exercises can be passive controlled by a therapist or caregiver, early initiated, with a gradual progression of exercise intensity and duration to prevent joint contracture or active performed by the patient, can include resistance training and functional training.[10]

A study by Wiechman et al. investigated the effects of active range of motion exercises on burn scar development. The study demonstrated that early initiation of range of motion exercises helped improve joint mobility, prevent contractures, and enhance functional outcomes. [10, 11]

Suman et al. conducted a study on children with burn injuries, implementing a 12-week resistance exercise program. The results showed significant improvements in skeletal muscle strength, highlighting the benefits of strengthening exercises in the rehabilitation of burns. [12,13]

Scar management:

Scar management is an integral part of burn rehabilitation. Scar management techniques can help prevent or reduce the appearance of scarring. These techniques can include massage, compression therapy, and the use of silicone sheets or gels. [14]

A study by Wasiak et al. evaluated different dressing techniques for superficial and partial thickness burns. The analysis concluded that dressings promoting a moist wound environment and silicone-based dressings were effective in reducing scarring and improving functional outcomes. [14-16]

Splinting:

Splinting involves the use of custom-made braces or supports to maintain proper alignment and prevent contractures. Splints can be used to immobilize or mobilize joints, depending on the patient's needs. [14]

Pain management:

Pain management techniques can include the use of medications, nerve blocks, and other interventions to reduce pain and promote comfort as the utilization of non-pharmacological interventions, such as distraction techniques or relaxation exercises.

Ciofi-Silva et al. conducted a literature review on pain management in burn patients. The study highlighted various pain management strategies, including pharmacological approaches, regional anesthesia techniques, and non-pharmacological interventions, such as music therapy and distraction techniques. Effective pain management contributes to better functional outcomes by enabling patients to participate more actively in their rehabilitation. [17]

Psychosocial Support and Rehabilitation:

Psychological rehabilitation is a crucial component of burn care in the acute phase, aiming to address the emotional and psychological challenges faced by burn survivors, by providing information about the healing process and realistic expectations, educating patients on self-care techniques, wound management, and scar management, addressing psychological distress, anxiety, and depression through counseling or therapy, and facilitating support

groups or connecting patients with burn survivor networks. The collaboration with mental health professionals is important to ensure holistic care. [18]

A study by Patterson et al. examined the role of psychosocial support in the rehabilitation of burn survivors. The findings emphasized the importance of providing emotional support, counseling, and psychoeducation to help individuals cope with the psychological consequences of burn injuries, reduce distress, and enhance psychological resilience.

Indeed, the rehabilitation of burn victims in the acute phase requires a multidisciplinary approach due to their ability to address the diverse needs of burn survivors comprehensively. Through collaborative efforts among healthcare professionals from various disciplines, these approaches optimize functional outcomes, provide effective pain management, offer psychological support, facilitate social reintegration, and ensure continuity of care.

Gibran and Heimbach emphasized the importance of multidisciplinary rehabilitation programs in burn care. These programs involve a coordinated approach involving physical therapists, occupational therapists, psychologists, and other healthcare professionals to address the complex needs of burn patients. Such programs have been shown to enhance functional outcomes and improve overall rehabilitation success.[19,20]

Conclusion:-

Functional rehabilitation in the acute phase of burn injuries is a critical component of the multidisciplinary approach to burn care. By implementing comprehensive assessments, early intervention strategies, and targeted therapies, functional rehabilitation aims to optimize recovery and restore function to burn survivors. Through a multidisciplinary approach, healthcare professionals can help individuals overcome the physical and emotional challenges associated with burn injuries, enabling them to regain independence and improve their overall quality of life.

References:-

1. C chiron JM rochet Rééducation et réadaptation de l'adulte brûlé Encyclopédie MÉDICOC HIRURGICALE 26-280-C-10
2. Richard, R., Baryza, M. J., Carr, J. A., Dewey, W. S., Dougherty, M. E. Forbes-Duchart, L. Young, A. (2009). Burn Rehabilitation and Research: Proceedings of a Consensus Summit. Journal of Burn Care & Research, 30(4), 543–573.
3. Baxter CR. Management of burn wounds. Dermatol Clin 1993; 11:709
4. Pham, TN, Girban, et al. Evaluation of the burn wound: Management decisions. In: Total Burn Care, 3rd edition, Herndon, D (Eds), Saunders Elsevier, Philadelphia 2007. p.119
5. Serrano C, Boloix-Tortosa R, Gómez-Cía T, Acha B. Features identification for automatic burn classification. Burns 2015; 41:1883.
6. Larson DL, Abston S, Evans EB, Dobrkovsky M, Linares HA. Techniques for decreasing scar formation and contractures in the burned patient. J Trauma 1971; 11 : 807-822
7. Beltramo F, Gayet C, Burghard S. Rééducation de l'enfant brûlé. Encycl Med Chir (Elsevier, Paris). Kinésithérapie-Rééducation fonctionnelle, 26-275-D-10, 1993 : 1-9
8. Birraux D. La rééducation du grand brûlé en phase aiguë. Kinesither Sci 1992; 317 : 46-56
9. Urger-Wagner A. Rééducation des brûlés. In : Grossiord A, Held JP eds. Médecine de rééducation. Paris : Flammarion, 1981 : 724-73
10. Serghiou MA, Niszcza J, Waibel BH, Gallagher JJ. Exercise interventions in burn rehabilitation: A systematic review and meta-analysis. Arch Phys Med Rehabil. 2020;101(9):1602-1611.e3.
11. Wiechman SA, Carrougher GJ, Esselman PC, Klein MB. The effects of active range of motion on burn scar development. J Burn Care Rehabil. 2005;26(3):208-214.
12. Suman OE, Spies RJ, Celis MM, Mlcak RP, Herndon DN. Effects of a 12-week rehabilitation program with music and exercise groups on range of motion in young children with severe burns. J Burn Care Res. 2008;29(6):939-948.
13. Suman OE, Spies RJ, Celis MM, et al. Effects of a 12-wk resistance exercise program on skeletal muscle strength in children with burn injuries. J Appl Physiol (1985). 2003;95(1):25-31
14. Edgar DW, Wood FM. Extremity burns: Functional outcomes and rehabilitation strategies. Clin Plast Surg. 2017;44(4):819-830.

15. Carrougheer GJ, Martinez EM, McMullen K, et al. Rehabilitation of the burn patient. Clin Plast Surg. 2017;44(3):557-566.
16. Wasiak J, Cleland H, Campbell F, Spinks A. Dressings for superficial and partial thickness burns. Cochrane Database Syst Rev. 2013;(3):CD002106
17. Ciofi-Silva CL, Monteiro TC, Gamba MA, et al. Pain management in patients with burns: Review of the literature. Rev Esc Enferm USP. 2014;48(2):350-358.
18. Patterson DR, Everett JJ, Bombardier CH, Questad KA, Lee VK, Marvin JA. Psychological effects of severe burn injuries. Psychol Bull 1993;113: 362-78
19. Gibran NS, Wiechman SA, Meyer WJ, Edelman LS, Fauerbach JA. Guidelines for the operation of burn centers: A consensus statement of the American Burn Association. J Burn Care Res. 2014;35(6):e318-e331.
20. Gibran NS, Heimbach DM. Rehabilitation of the burn patient. Clin Plast Surg. 2009;36(4):671-684.