The Skin Graft Versus Local Flaps In The Management Of Post Burn Knee Contractures

Thesis

For partial fulfillment of the Master Degree in **General Surgery**

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ABSTRACT

The skin graft versus local flaps in the management of post burn knee contractures. Post burn contracture is one of the most frustrating complications of deep burns. Its management consider as challenge for plastic surgeon. There are different procedures for treatment of post burn knee contractures as release of contracture, skin graft and local flaps. Post operative splintage. Post operation physiotherapy.

Key words

Burn

Kun contractures

Skin greft

Local flaps

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INTRODUCTION

Post burns contracture is one of the most frustrating complications of deep burns *(Iwnagwu et al, 1999)*.

Reconstruction of defects around the knee and proximal one third of the lower leg has always been a challenge for the plastic surgeon *(Hong et al, 2003)*

1966 and 1968, Ger used a skin-grafted, muscle flap for lower extremity reconstruction. In1978, Feldman and colleagues used a medial gastrocnemius musculocutaneous flap for reconstruction of the upper third of the lower leg *(Ger, 1966; Ger, 1968; Feldman et al., 1978)*.

When severe and extensive, it can be a challenging problem for the treating surgeon. a fact well demonstrated by the prevalence of different procedures for its treatment, which includes release of the contracture and skin grafting , simple or multiple z-plasty ,local flaps and tissue expanders and free flaps. Each has its advantages and disadvantages *(Wilson, 2000; Iwnagwu et al., 1999; Prakash, 2000; Serkan et al., 2003; Hyakusoku et al., 1991; Pisarski et al., 1998; Yildirim et al., 2003)*.

For prevention of contracture and deformity of the lower extremity is early management such as escharotomies as indicated, Aggressive wound care with early excision and grafting, leg elevation, and early ambulation *(Witt and Achauer, 1991)*.

Leman hypothesizes that early ambulation protocols, emphasis on cardiopulmonary endurance activities, effect of gravity on posture, effectiveness of contracture prevention techniques that allow function, and frequent standing and walking emphasizing normal lower extremity function all contribute to less need for later reconstruction. Occasionally, deformities of the lower extremity such as popliteal contractures and soft tissue defects after burns with exposed deep structures will require reconstruction. Popliteal contractures may be treated with local skin flaps, or scar release and grafts. Deep tissue defects require flaps, and unstable scars require resurfacing with grafts. Following surgery, prefabricated knee immobilizers or custom-made knee splints are indicated *(Leman, 1992)*.

Use of Unna boots allows early ambulation postoperatively and serves as a good initial pressure bandage until custom garments are fit *(Harnar et al., 1982; Grube et al., 1987; Ainsworth et al., 1991; Cox and Griswold, 1993)*.

Splints or pins may be required to improve graft survival at joints and to prevent contracture. Ideal point positions are extension in the neck, knee, elbow, wrist, and interphalangeal joints, 15-degree flexion at metacarpophalangeal joints, and abduction at the shoulder *(Leman, 1992)*.

Aim Of The Work

To evaluate and compare skin graft and local flaps in treatment of post burn knee Contracture, and both their aesthetic and functional outcome at Kasr El-Aini University Hospital.

ANATOMY OF KNEE

The knee joint joins the thigh with the leg and consists of two articulations: one between the femur and tibia, and one between the femur and patella. It is the largest joint in the human body and is very complicated. The knee is a mobile trocho-ginglymus (i.e. a pivotal hinge joint), which permits flexion and extension as well as a slight medial and lateral rotation. Since in humans the knee supports nearly the whole weight of the body, it is the joint most vulnerable to both acute injury and the development of osteoarthritis. It is often grouped into tibiofemoral and patellofemoral components. (The fibular collateral ligament is often considered with tibiofemoral components *(Platzer and Werner, 2004)*.

Fig. (1): Knee *(Platzer, Werner 2004)*.

Human anatomy

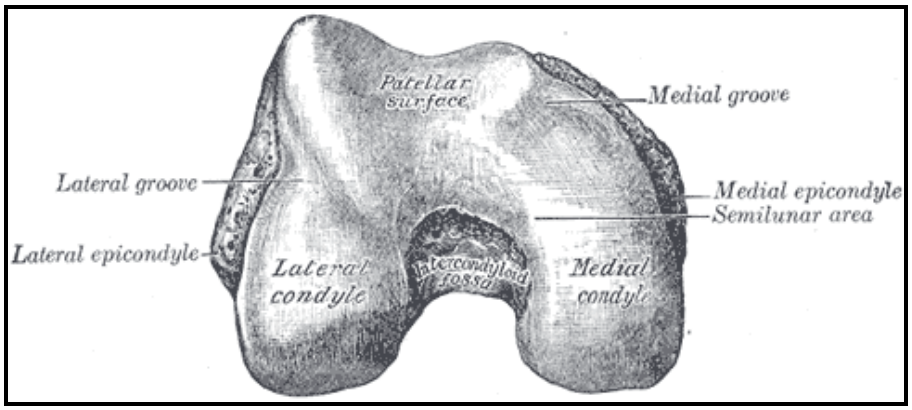

Fig. (2): Articular surfaces of femur *(Platzer and Werner, 2004)*.

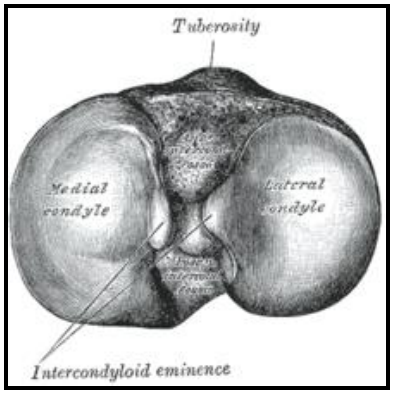

Fig. (3): Articular surfaces of tibia *(Platzer and Werner 2004)*.

The knee is a complex, compound, condyloid variety of a synovial joint. It actually comprises three functional compartments: the femoropatellar articulation consists of the patella, or "knee cap", and the patellar groove on the front of the femur through which it slides; and the medial and lateral femorotibial articulations linking the femur, or thigh bone, with the tibia, the main bone of the lower leg. The joint is bathed in synovial fluid which is contained inside the synovial membrane called the joint capsule. Upon birth,

a baby will not have a conventional knee cap, but a growth formed of cartilage. In human females this turns to a normal bone knee cap by the age of 3, in males the age of 5 *(Platzer and Werner, 2004)*.

Articular bodies

The articular bodies of the femur are its lateral and medial condyles. These diverge slightly distally and posteriorly, with the lateral condyle being wider in front than at the back while the medial condyle is of more constant width. The radius of the condyles' curvature in the sagittal plane becomes smaller toward the back. This diminishing radius produces a series of involute midpoints (i.e. located on a spiral). The resulting series of transverse axes permit the sliding and rolling motion in the flexing knee while ensuring the collateral ligaments are sufficiently lax to permit the rotation associated with the curvature of the medial condyle about a vertical axis. The pair of tibial condyles are separated by the intercondylar eminence composed of a lateral and a medial tubercle. The patella is inserted into the thin anterior wall of the joint capsule. On its posterior surface is a lateral and a medial articular surface, both of which communicate with the patellar surface which unites the two femoral condyles on the anterior side of the bone's distal end. A common disease found in the knee is "Tartas" *(Platzer and Werner, 2004)*.

Articular capsule

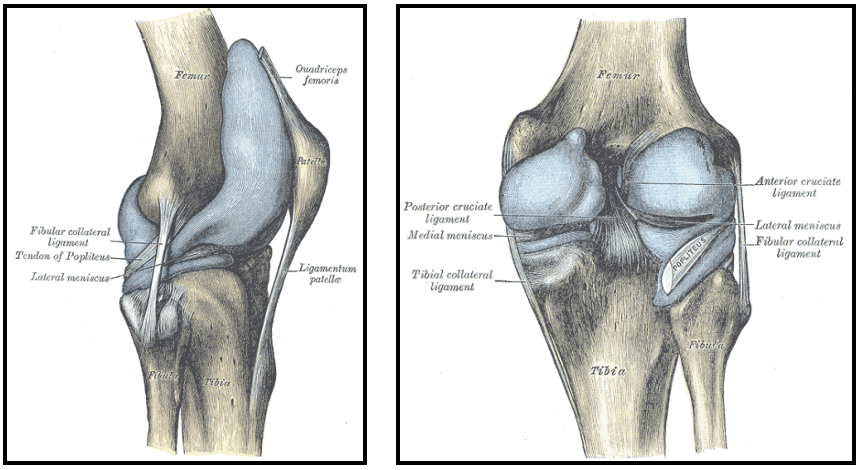

Fig. (4): Lateral and posterior aspects of right knee *(Platzer and Werner, 2004)*.

The articular capsule has a synovial and a fibrous membrane separated by fatty deposits. Anteriorly, the synovial membrane is attached on the margin of the cartilage both on the femur and the tibia, but on the femur, the suprapatellar bursa or recess extends the joint space proximally. The suprapatellar bursa is prevented from being pinched during extension by the articularis genu muscle. Behind, the synovial membrane is attached to the margins of the two femoral condyles which produces two extensions similar to the anterior recess. Between these two extensions, the synovial membrane passes in front of the two cruciate ligaments at the center of the joint, thus forming a pocket direct inward *(Platzer and Werner, 2004)*.

Bursae

Numerous bursae surround the knee joint. The largest communicative bursa is the suprapatellar bursa described above. Four considerably smaller bursae are located on the back of the knee. Two non-communicative bursae are located in front of the patella and below the patellar tendon, and others are sometimes present *(Platzer and Werner, 2004)*.

Cartilage

Cartilage is a thin, elastic tissue that protects the bone and makes certain that the joint surfaces can slide easily over each other. Cartilage ensures supple knee movement. There are two types of joint cartilage in the knees: fibrous cartilage (the meniscus) and hyaline cartilage. Fibrous cartilage has tensile strength and can resist pressure. Hyaline cartilage covers the surface along which the joints move. Cartilage will wear over the years. Cartilage has a very limited capacity for self-restoration. The newly formed tissue will generally consist for a large part of fibrous cartilage of lesser quality than the original hyaline cartilage. As a result, new cracks and tears will form in the cartilage over time *(Platzer and Werner, 2004)*.