SUMMARY

In this essay, a review of the literatures dealing with fractures of the upper extremity of the tibia has been done.

The tibial plateau is one of the most critical load bearing surfaces in the human body. In the coronal view the articular surface of the tibial plateau is perpendicular to the longitudinal axis of the bone, this is not true in the sagittal view. Seen in profile, the tibial plateau slopes backwards at an angle of 10- 15 degrees to the horizontal plane. (Courvoisier, 1973).

The upper end of the tibia is widely expanded especially in its transverse axis, to provide a good bearing surface for the body weight transmitted through the lower end of the femur.

It flares from the shaft proximally in the sub-condylar area for ligament and tendon attachment, it has a smaller articulation for the proximal tibiofibular joint and a relatively flat articular area to support the femoral condyles.

A very thin compact bone, which is fragile particularly around the margins of the plateau, surfaces it, it is composed of two prominent masses named medial and lateral condyles and a prominent tuberosity projecting anteriorly from its lower part. Superiorly each of the condyles is covered with an articular surface the two being separated by an irregular roughed non articular intercondylar area. (Last, 1985).

Knowledge of the trabecular bony structure of the upper end of the tibia can contribute to an understanding of the different types of fractures liable to occur there, as well as their prevalence. (Duprac and Ficat, 1960).

Bio-mechanical analysis confirm that during abduction of the knee the center of rotation is medial to the inter-condylar eminence and the hinge in this mechanism is the medial collateral ligament which is tight in full extension.

In full extension the contact zone between femoral and tibial condyles is anterior. As the degree of flexion increases, the contact zone moves posteriorly.

The knee acts like closed kinematic chain that can only move in a direction defined by other parts. In the knee, system include femoral, tibial condyles and ligament connecting each other, if part of the chain is removed, the movement will be altered unless replaced by identical geometrical slap. This early range of motion in flexion and extension while protecting the knee from rotatory motion or varus or valgus stress, may help the joint to remold to its proper shape. (Struhen, 1982).

Tibial plateau fractures can occur at any age with similar frequency in either sex. The majority of patients suffering from fracture of the tibial plateau have been victims of motor vehicle accidents (driver or passenger), bumper strikes (Pedestrian vs. Automobile), (Torisu, 1977).

The fracture pattern produced depends on the magnitude of the force exerted as well as the amount of knee flexion at the moment of impact. Studies indicate that when abduction force is applied, split or cleavage fracture pattern occurs.

Many classifications for tibial plateau fractures have been studied. Hohl and Luck classification, (Hohl& Luck, 1956), which is expanded by Hohl, 1967. Muller classification, (Muller et al 1970), Rasmussen classification, (Rasmussen 1973), Courvoisier classification, (Courvoisier, 1973).

The classification of Shatzker et al in 1979 is a result of exhaustive study of 79 fractures in Toronto between 1968 to 1975 then modified in 1987 and finally in 1993 and it is the most used classification of tibial plateau fractures in North America.

The association for study of internal fixation (ASIF) originally classified tibial plateau fractures into wedge, depression wedge and depression, Y - shaped, T - shaped, and comminuted fracture types .

Muller et al in 1990 states that a classification is useful only if it considers the severity of the bone lesion and serves as a basis for treatment and for evaluation of the results.

Khan et al., 2000 based on study of 80 cases, classified tibial plateau fractures topographically into seven broad groups. This is an alphanumeric system, which in some respects is similar to the AO universal classification system proposed by Muller et al in 1990, and those described by Tscherne and Lobenhoffer in 1993.

To have any chance of success, all treatment must be based on the best possible diagnosis of the injury. The fractures of the knee are not exception to this general principle, which gives the final outcome of the treatment given to patients suffering from tibial plateau fractures. (Paolo and Roberto, 1993).

Disruption of the articular surface of the knee can lead to gross alteration in knee kinematics. Tibial plateau fractures are often accompanied by lesion of the bony structures or of the soft tissue, surrounding or forming an integral part of articulation (Courvoisier, 1973).

With the use of MRI, ligamentous injuries were observed at higher percentages in tibial plateau fractures than were previously thought. (Bennette and Browner, 1994).

In the past, tibial plateau fractures were a difficult area of fracture care for orthopaedic surgeon. (Kate and Robert, 1965), but nowadays; there are several recent methods of solutions that dealing with these fractures.

Despite the frequent occurrence of fractures of tibial Plateau, the principle of their treatment is still debated; the goals of treatment of a tibial plateau fracture are to obtain a stable, aligned, mobile and painless joint and to minimize the risk of postoperative arthritis. (Custilo, 1993, Schatzkei, 1993).

***There are 3 essential objectives of treatment:**

1- To correct the displacement and depression

2- To immobilize the limb

3- To prevent wasting of the quadriceps muscle

Selecting a method of treatment after a tibial plateau fracture depends on the type of injury and surgeon factors, and also the patients factors.

Various methods of stabilization were used; plaster cast immobilization, pins and skeletal traction in additions to open reduction and internal fixation by plates and screws.

Conservative treatment is rather an expression of therapeutic mechanism in which the end results are left to chance; surely those who have seen the end results of conservative treatment must regard this as a mal-presentation of the principles of fracture treatment.

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Effectively' reduced split fragments with indirect reduction and percutaneous screw fixation but thought that this technique was not applicable to bi-condylar fractures of the tibial plateau.

Fred in 1998 states that surgical treatment of tibial plateau fracture with ring or hybrid frames is an accepted alternative to non operative options or internal fixations.

External fixators, had been widely used to manage comminuted peri-articular fractures with many advantages over other methods of stabilization most important of them is minimal soft tissue dissection and possibility of early joint motion.

Many classifications for external fixators had been described, the most subjective one is to classify them into, pin fixators,*(Behrens, 1989),* ring fixators, *(Calhoun et al., 1992 and Orbay et al., 1992).* and mixed new hybrid fixators, *(Pugh et al, 1999).*

Tibial plateau fracture is of the most difficult fractures to treat. Many treatment options were used but the best results in open tibial plateau fractures were obtained with external fixators using the concept of osteotaxis.

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