

# ORIGINAL

## SUMMARY

The injured knee constitutes a serious problem and is a significant cause of disability among athletes and active soldiers in the BDF and Police Force. In most surveys, knee injuries constitute 15 to 20%<sup>1</sup> of all sports injuries. Since we cannot completely prevent knee injuries, we must be prepared to diagnose and treat them in the best manner possible.

A total of 116 knees suspected of having an internal derangement operated on at the BDF Hospital between April 1979 and April 1981 are briefly surveyed.

An accurate diagnosis will be reached in the majority of acute injuries to the knee by means of a detailed history and careful examination. Examination under general anaesthesia (G.A.), arthrography and arthroscopy are of immense value in the more complex injuries.

The real problem we face is the time lapse between the occurrence of trauma and the referral of the patient to the Consultant's Clinic. Less than five percent of patients attended within a few days of injury. In many of these, the time for optimum management had already passed. Successful treatment depends on accurate diagnosis and initiation of treatment should be at the optimum time for management. We believe as advocated by O'Donoghue<sup>2</sup>,

## An Approach to Knee Injuries at the BDF Hospital

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Hughston<sup>3</sup> and others that aggressiveness in treatment will lead to less disability and a higher percentage of functional returns.

### Survey - April 1979 to April 1981 at the Military Hospital, Bahrain

Total number of patients reviewed : 116

Of these injuries, 70% occurred during sports activities and of the total 96% were males and 4% females. The various procedures carried out were :-

1. Arthroscopy : 105
2. Meniscetomy : 33
3. Reconstruction : 15
4. Surgery for : 14
  - Chondromalacia
  - Patellae

The time interval between occurrence of injury and surgical intervention was :-

1. One month : 19
2. Three months : 17
3. Six months : 14
4. One year : 12
5. Two years : 10
6. Three years : 5
7. Five years : 7
8. Over 5 years : 6
9. Interval not recorded : 26

## ARTHROSCOPY

Of 105 knees subjected to arthroscopy, internal derangement, of sufficient magnitude to require intervention, was diagnosed in 73 (69%). Ten patients refused surgery.

## MENISCETOMY

Of 33 meniscetomies, 19 were medial and 14 were lateral.

## RECONSTRUCTION

Primary reconstruction was performed in two patients. The anterior cruciate ligament was found to be detached from the tibial plateau in each of these and was reattached by drilling the tibia and held in place with a Button and a dextron suture. Extra articular reconstruction was carried out in 11 patients, six of whom had a reconstruction for medial rotatory instability using a modified Slocum's<sup>4</sup> procedure. Four patients had a lateral reconstruc-

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tion, using Ellison's<sup>5</sup> and one patient had both medial and lateral reconstruction. Two patients had an intra-articular reconstruction using the medial one third of the infra-patellar tendon to replace the anterior cruciate ligament. (A future paper will discuss our reconstruction techniques from April 79 to date).

## CHONDROMALACIA PATELLAE

Although this condition may occur without a history of trauma, in this series, injury was a definite aetiological factor and manifested itself either primarily due to direct trauma to the patella or as a complication of an intra-articular lesion.

Fourteen knees required surgical management, lateral release being done in 10. Two patients were treated with a Elmslie-Trillat<sup>6</sup> procedure which includes (1) a lateral incision, (2) lateral retinacular release, (3) medial capsular reefing, (4) medial and/or inferior transfer of the infra patellar tendon insertion, leaving the lower periosteum intact. (Note: In the young, if closure of the Epiphyseal plate has not been completed, this procedure is contra-indicated). One knee was treated by a modified Slocum<sup>6</sup> technique in which (1) the lateral half of the patellar tendon is transferred medially, thereby realigning the patella, followed by (2) a lateral release and medial capsular reefing. (a separate paper will be presented reviewing our results with Chondromalacia Patellae).

## MANAGEMENT OF ACUTE KNEE INJURIES

### History

A full and detailed history including an accurate description of the mechanism of injury must be taken. We would advocate the use of a tape-recorder to document this latter in the patient's own words.

Questions should determine :

1. If contact forces were involved and if so from what direction?
2. If weight was on the injury extremity at the time of injury, what was the relationship of body weights to the injured extremity at the time of occurrence ?
3. If the individual was able to continue playing or exercising.
4. If he heard or felt a 'pop'.
5. The exact location of the pain.
6. If swelling occurred and if so how rapidly this developed.



Fig. 1a

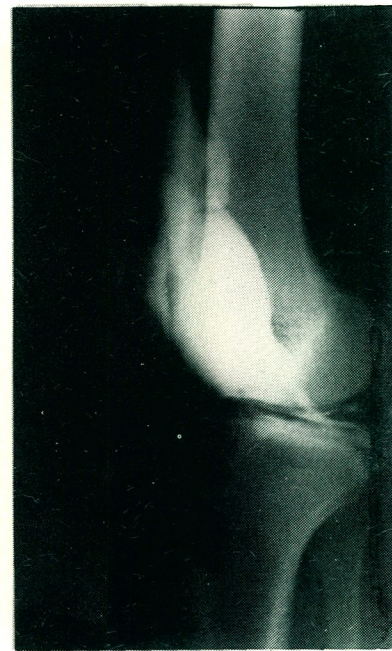


Fig. 1b.

Fig. 1a. shows tear of posterior capsule and leakage of die

Fig. 1b. shows no tear and no leakage of die



Fig. 2

Fig. 2. A.P. view showing loss of M.C.L.



## PAST HISTORY

Does the patient have a history of previous injuries?

## EXAMINATION

Early examination is more likely to detect an injured ligament.

As time passes muscle spasm develops and makes detection of joint instability and ligamentous laxity more difficult.

The use of valium may be of help in the examination of acute knee injuries. We prefer to examine acutely injured knees under G.A., especially if there is gross swelling and a suspicion of haemarthrosis.

Our route is as follows:-

1. Under G.A. the knee is examined for ligamentous instability and signs of a tear in the semilunar cartilages.
2. The knee is aspirated and if blood is present this is poured into a kidney dish in order to look for fat globules which may indicate the presence of an osteochondral fracture.
3. 10 cc to 20 cc of Hypaque are injected into the knee and AP and lateral films taken. The main advantage of this arthrogram (Fig.1a & b) is to detect a tear of the posterior capsule (Figure 2). Stress films may be taken and will document ligamentous laxity. Fig. 2
4. We proceed to arthroscopy and our routine for this procedure will be presented in a separate paper. In acute cases we recommend the use of a tourniquet.

## DISCUSSION

Problems in diagnosis of acute knee injuries are more likely to present themselves to inexperienced medical or paramedical

personnel than to the expert. Nevertheless, as successful management depends on accurate diagnosis, responsibility for the consequences of failure to appreciate the nature and implications of an injury lies with the original examiner. Some of these injuries, e.g. total rupture of the medial collateral ligament and the "unhappy triad" of O'Donoghue<sup>2</sup>, constitute a real surgical emergency and must be dealt within the first few days if serious sequelae are to be avoided. In this context it should be noted that a meniscus injury is the commonest single cause of mono-compartment osteoarthritis.

O'Donoghue<sup>2</sup> in his book "Treatment of Injuries to Athletes" suggests taking an X-ray in what he calls the "as is" position, as well as routine AP and lateral films plus a standing AP film of both knees.

We agree with smillie<sup>7</sup> and others and do not advocate the use of a full plaster cylinder when dealing with an acute knee injury. Our routine is to use three plaster slabs posterior, lateral and medial.

In our opinion arthroscopy in the acute stages is of the greatest help in reaching an accurate diagnosis. Even in cases where surgical intervention is subsequently found not to be required the knee can be thoroughly cleaned via the arthroscope with removal of blood and possible loose bodies thus enhancing the recovery of the patient.

The treatment of athletes poses special problems to those responsible for the management of injuries. The aim is not only to deal with the acute injury but to take the fully recovered patient back to the arena where the same forces that caused the initial injury still exist.

As Fred Allman, Jr.<sup>8</sup> puts it, the ten commandments which follow, form the main guidelines of management.

1. Pre-participation evaluations.
2. Conditioning which includes heat acclimatisation.
3. Equitable competitions.
4. Adherence to and enforcing proper rules and regulations.
5. Proper coaching techniques.
6. Protective equipment and playing facilities.
7. Optimum nutrition.
8. Prompt proper treatment when injury occurs.
9. Rehabilitation following injury.
10. Re-evaluation of the athletes before he return to competition.

## REFERENCES

1. Blyth, C.S. and Mueller, F.O.; Football Injury Survey. The Physician and Sports Medicine, Vol. 2, No. 9, p. 45, 1974.
2. O'Donoghue, D.H. : Treatment of Injuries to Athletes. Philadelphia, W.B. Saunders Company, 1976.
3. Hughston, J.C.; Whatley, G.S. ; and Dodelin, R.A. : The Athlete and His Knees. South. Med. J. 54: 1372-1378, 1962.
4. Slocum, D.B. and Larson, R.L. : Pes Anserinus Transplantation. A surgical Procedure for Control of Rotating Instability of the Knee. J. Bone and Joint Surg. 50-A; 226-242, 1968.
5. Ellison A : Knee Injuries, Clinical Symposia-CIBA, 29 : pp. 18-37, 1977.
6. Jay S. Cox, MD., : An evaluation of the Elmslie-Trillat procedure for management of patellar dislocations and subluxations: A preliminary report. The American Journal of Sports Medicine, Vol. 4, No. 2, 1976.
7. I.S. Smillie., Injuries of the Knee Joint: Fifth Edition.
8. DeHaven, K. and Allman, F.L.: Isolated Anterior Cruciate Ruptures. Presented at A.O.A. Resident meeting, Durham, 1971.
9. Personal contact with Dr. Fred Allman. Personal contact with Capt. Jay S. Cox, M.D., Naval Hospital, U.S. Naval Academy, Annapolis, MD. 21402. □□



life as in our third case (3). Bonham et al reported on 34 cases of congenital lobar diaphragmatic hernia admitted to Great Ormond Street Hospital for sick children over a period of 14 years (2). Gross reported 35 cases from Boston Children's Hospital over the same period (5). We diagnosed six cases over a period of two years. This is very large a number for a population of 350,000 and an annual birth rate of about 10,000 in Bahrain.

The most common presentation is cyanosis at birth or few hours later. Rickhame reported (8) 84 cases from Liverpool Regional Hospital during 1954 to 1975 of which 72 were cyanosed after birth. 47 of these had dyspnea and four had apnea at birth, all of whom died. Vomiting was an uncommon symptom presented only in six cases. Vomiting might indicate malrotation of the midgut or rupture of the stomach. Strangulation and gangrenous stomach is extremely rare in this condition (7). Among our cases, three neonate presented with severe dyspnea and cyanosis at birth, which is the most common and usual presentation. The other three cases had a very unusual presentation. One presented with acute peritonitis with gangrenous perforated stomach. A second one presented with mild gastrointestinal symptoms on two occasions with mild left pneumonia but ended by sudden herniation of some of the intraperitoneal content to the chest through a congenital defect which was there since birth. The explanation of the sudden herniation at one year of age is not very clear. But a sudden increase in the negative intrapleural pressure as in cases of chest infection with dyspnea can suck the abdominal contents into the chest. Another explanation might be that increase in intra-abdominal pressure can push the intraperitoneal contents into

the chest through the congenital defect in the diaphragm. The third case presented with tachypnea at birth but there was some difficulty in differentiating it from diaphragmatic eventration. We should mention that we did suspect a large congenital diaphragmatic hernia in the lateral views but this was disproved by screening the diaphragm. We delayed the operation for two reasons: First, because the baby improved with oxygen therapy in the first few days; secondly we felt that if the case was an eventration needing surgery it would be safer to wait few weeks and have reasonable diaphragmatic tissue for plication.

We believe the abdominal approach is ideal for left sided hernia. It is easy to reduce the hernial content, examine the peritoneal cavity for any other congenital anomalies and avoid the post operative problems of thoracotomy. We prefer the thoracic approach for the right sided hernias which is rare. The hernial sac might be absent but if it is intact it must be resected and the hernial defect closed with interrupted non-absorbable sutures. It is usually advised to close the diaphragmatic defect in two layers by overlapping we do not feel that this was necessary in our experience. A one layer simple closure is adequate easy and less time consuming in critically ill neonates under anaesthesia and furthermore in some patients there is not enough diaphragmatic muscle tissue for overlapping. It is usually not difficult to approximate the two rims of the diaphragmatic defect. In one case we had to bring the anterior rim of the diaphragmatic defect to the posterior intercostal muscles. The post-operative management is the most challenging aspect of Bochdalek's hernia, particularly if associated with lung hypoplasia.

These neonates do very well in the immediate post-operative period till the honey-moon period is over. After four to five days they get progressive hypoxia with carbon dioxide retention as a result of pulmonary arterio venous shunting, pulmonary vasoconstriction and hypertension. Different pulmonary vasodilators have been tried with no definite success. Ligation of patent ductus arteriosus has been attempted to decrease the amount of arterio venous shunting but with no success. The result of surgical intervention in neonates is excellent if the respiratory distress appears after the first twenty-four hours of the neonates life. This usually suggests that there is no lung hypoplasia and if there is it will be minimal. In our three reported cases all had their symptoms after the first twenty four hours of birth. One at two days of age, one at two months and the third at one year. All had uneventful post-operative recoveries inspite of the fact that case No. 1 had severe diffused peritonitis with septicemic shock and perforated gangrenous stomach.

## SUMMARY

Three unusual presentation of congenital posterolateral Bochdalek's diaphragmatic hernia were described. The first case presented at two months of age with acute peritonitis and with perforated gangrenous stomach. The second case presented with tachypnea after birth and the chest x-ray suggested eventration of the right diaphragm and the third case had a congenital posterolateral diaphragmatic defect without herniation until one year, when she presented with gastrointestinal symptom and left side pneumonia and suddenly became dyspneic, as a result herniation of intraperitoneal contents into her chest. The clinical presentation, the radiological find-

ings of these cases were described and the surgical management and the results were discussed.

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#### REFERENCES

1. Bochdalek, V. (1848) "Einige Betrachtungen ueber die Einstellung des angeborene Zwerchfellbruches als Beitrag zur pathologischen Anatomie der Hernien" Vieteljahrs. prakt. Heilk., 19, 89.
2. Bonham Carter, R.E., Waterson, D.J. and Aberdeen, E. (1962) "Hernia Eventration of the Diaphragm in Childhood", *Lancet*, i, 656.
3. Day, B. (1972) "Late appearance of Bochdalek Hernia", *BR. MED. J.* 1, 786.
4. Greenwald, H.M. and Steiner, M. 1929 "Diaphragmatic Hernia in Infancy and Childhood", *AM J DIS Child*, 38, 361.
5. Gross, R.E. (1953). *The Surgery of Infancy and Childhood*. Philadelphia W.B. Saunders.
6. Ladd, W.E. and Gross, R.F. (1940). "Congenital Diaphragmatic Hernia". *New Engl. J MED* 223, 917.
7. Rickham, P.P. (1955) "Strungulated Diaphragmatic Hernia in Newborn Period" *Thorax*, 10, 104.
8. Rickham, P.P., Lister J. Irving, I.M. *Neonatal Surgery* (1978) Butterworths London, Boston, 165. □□