RESULTS

Results

This study comprised 100 male cyclists whose ages varied between 15 and 30 years. They were suffering from soft tissue disorders or injuries related to sport events during their sharing in local or international cycling competitions.

They were classified into two groups according to their ages.

Group A: included 50 junior cyclists (50%) from the age 15-17 years (mean 15.96 $\pm$ 0.68).

Table,(1) shows personal characteristics and type of soft tissue injury in junior cyclists.

Group B: included 50 senior cyclists (50%) from the age 17-30 years (mean 22.42 $\pm$ 3.52).

Table,(2) shows personal characteristics and type of soft tissue injury in senior cyclists.

N.B.: The recorded types of injuries were calculated to the total no - of injuries.

The clinical findings of all patients were recorded as follows:

**** Anatomical site of injuries:***

As regards the anatomical site, the following regions were found to be affected:

@ The lower limb injuries, came in the first place of all body injuries. It comprised 61.5% of the total injuries in junior cyclists and 68% of the total injuries in senior cyclists.

@ The knee injuries in junior cyclists comprised 30.8% of injuries and the thigh, leg, ankle and foot group represented 30.8% of injuries.

@ The knee injuries in senior cyclists comprised 33.9% of injuries while the thigh, leg, ankle and foot were repesented 44.6% of injuries.

@ The upper limb injuries in juniors comprised 23.1% of all injuries while in senior cyclists the upper limb injuries comprised 18.7%.

@ The hand and arm injuries represented 18.5% in junior cyclists while in senior cyclists they represented 21.5%. Injuries of the elbow represented 4.6% in junior cyclists while no injuries of the elbow seen in senior cyclists.

@ Back injuries comprised 15.4% in juniors and 13.4% in seniors.

@ Table (3) shows the sites of injury in relation to studied groups.

@ Table (4) shows the anatomical sites of injury in relation to the studied groups.

@ Figures (15A) and (15B) show the anatomical sites of injuries among the studied groups.

Types of soft tissue injuried:

In our study the most common soft tissue injuried in junior cyclists were, muscles (18.5%), ligaments, joints and tendons (6.1%), bursae (12.3%), nerves (7.7%) and epiphysis (55.4%).

In senior cyclists the soft tissue injuried were, muscles (22.7%), ligaments joints and tendons (45.3%), bursae (4%), nerves (25.3%) and synovial membrane (2.7).

* Table (5) and Fig (16) show type of soft tissue injuried amoung the studied groups.

Types of soft tissue injuries:

As regards the types of injuries we found that the most common injuries in juniors were: tibial apophysitis 18.5% calcaneal apophysitis 13.8%, chondromalacia patellae 6.2%, lower ulnar apophysitis 10.8%, dorsal apophysitis 9.2% and lumbo sacral muscle strain 6.2%.

* Table (6) and fig (17) show the distribution of injuries in junior cyclists. In senior cyclists the most common injuries were: chondromalacia patellae 20%, tendo Achillis tendinitis 13.3%, sciatica 6.7%, quadriceps muscle strain 5.4%, ulnar tunnel syndrome 13.3% carpal tunnel syndrome 5.3% and lumbo sacral muscle strain 9.3%.

* Table (7) and Fig (18) show the distribution of injuries in senior cyclists.

* **Affected sides:**

As regards the affected sides, we noticed that 58.5% of injuries in juniors and 60% in seniors, were of the right side, while 18.5% in juniors and 9.3% in seniors were of the left side, and 7.7% were bilateral in juniors and 16% in seniors. Most of cases were in the dominant side.

* Table (8) and Fig (19) show the affected side in both junior and senior cyclists.

* **Performance:**

As regards injuries in relation to the level of performance of cyclists, we found that, most of junior injuries occured in the third group (37%) while 27.7% of injuries occurred in the second group and the least percentage was reported in the first group (12.3%).

Also most of injuries in senior cyclists occured in the third group (37.3%) while 21.3% of injuries occurred in the second group with 8% only occurring in the first group.

* Table (9) and Fig (20) show the relation between the level of performance and injuries.

* **Occurrance of injuries in relation to season of cycling:**

As regards the occurrance of injuries in relation to season of competition, we found that most of injuries occurred at the end of season 49.2% in juniors and 36% in seniors, while at mid season 21.5% occurred in juniors and 10.7% in seniors.

In early season the occurrance of injuries were 6.2% in juniors and 16% in senior cyclists.

* Table (10) and Fig (21) show the occurrance of injuries in relation to season of competition.

* **Similar injuries in both junior and senior cyclists:**

It is observed that the identical injuries in junior and senior cyclists were: chondromalacia patellae, carpal tunnel syndrome, lumbo sacral muscle strain and ulnar tunnal syndrome.

* Table (11) shows similar soft tissue injuries in both junior and senior cyclists.

* **Combined injuries:**

We noticed that combined injuries were reported in 30% of junior cyclists and in 50% of senior cyclists.

* Fig (22) shows single and combined injuries among the studied groups.

Table (1) shows soft tissue injuries in junior cyclists

(Group A,n=50 cyclists)

Case No	Age year	Access in sport	Time of injury	Performance	Diagnoses
1	15	one year	End of season	2nd group	Rt lower Ulnar epiphysitis
2	15	one year	End of season	2nd group	Rt tibial apophysitis Dorsal apophysitis
3	15	one year	End of season	1st group	Lumbosacral muscle strain
4	15	one year	Early season	3rd group	Rt. quadriceps muscle strain
5	15	one year	Mid season	3rd group	Rt. popliteal bursitis
6	15	one year	End of season	3rd group	Lt. tibial apophysitis Lumbo sacral muscle strain
7	15	one year	End of season	3rd group	Rt. tibial apophysitis
8	15	one year	End of season	3rd group	Rt. tibial apophysitis
9	15	one year	End of season	2nd group	Lt. lower ulner epiphysitis
10	15½	1½ year	End of season	2nd group	Rt. tibial apophysitis
11	15½	1½ year	Mid season	3rd group	Rt. calcaneal apophysitis
12	15½	1½ year	End of season	3rd group	Dorsal apophysitis Rt. olecranon bursitis
13	15½	1½ year	End of season	3rd group	Bi. iscial epiphysitis Rt. quadriceps muscle strain
14	15½	1½ year	End of season	2nd group	Rt. tibial apophysitis
15	15½	1½ year	Mid season	3rd group	Rt. lower ulnar epiphysitis Rt. popliteal bursitis
16	15½	1½ year	End of season	1st group	Rt. calcaneal apophysitis
17	15½	1½ year	End of season	3rd group	Rt. lower ulnar epiphysitis
18	15½	1½ year	Mid season	3rd group	Lt. olecranon bursitis
19	15½	1½ year	Mid season	2nd group	Lt. calcaneal apophysitis
20	15½	1½ year	End of season	3rd group	Bi. tibial apophysitis Rt. lower ulnar epiphysitis
21	16	Two years	End of season	3rd group	Rt. calcaneal apophysitis
22	16	Two years	Mid season	2nd group	Rt. semimembranosus bursitis

Case No	Age year	Access in sport	Time of injury	Performance	Diagnoses
23	16	Two year	End of season	3rd group	Dorsal apophysitis Rt. olecranon bursitis
24	16	Two year	Mid season	2nd group	Lt. tibial apophysitis
25	16	Two year	End of season	1st group	Lt. lower ulnar epiphysitis
26	16	Two year	End of season	3rd group	Rt. lower ulnar epiphysitis Rt. calcaneal apophysitis
27	16	Two year	Early season	2nd group	Rt. hamstring muscle strain
28	16	Two year	End of season	1st group	Bi. ischial epiphysitis
29	16	Two year	End of season	2nd group	Rt. calcaneal apophysitis
30	16	Two year	End of season	1st group	Dorsal apophysitis
31	16	Two year	End of season	3rd group	Rt. retro patellar bursitis
32	16	Two year	End of season	2nd group	Rt. calcaneal apophysitis Rt. calf muscle strain
33	16	Two year	Mid season	3rd group	Rt. calcaneal apophysitis
34	16	Two year	Mid season	3rd group	Rt. carpal tunnel syndrom
35	16	Two year	End of season	1st group	Rt. tibial apophysitis
36	16½	3 years	End of season	3rd group	Lt. tibial apophysitis
37	16½	3 years	Mid season	1st group	Dorsal apophysitis
38	16½	3 years	End of season	2nd group	Rt. tibial apophysitis Rt. calf muscle strain
39	16½	3 years	Early season	3rd group	Rt. hamstring muscle strain Rt. chondromalacia of patella
40	16½	3 years	Mid season	2nd group	Dorsal apophysitis
41	17	3 years	End of season	3rd group	Rt. tibial apophysitis Rt. ulnar tunnel syndrome
42	17	3 years	Mid season	2nd group	Rt. ulnar tunnel syndrome
43	17	3 years	End of season	3rd group	Bi. chondromalacia of patellae
44	17	3 years	End of season	3rd group	Lumbosacral muscle strain Rt. carpal Tunnel Syndrome
45	17	3 years	End of season	2nd group	Lt. quadriceps muscle strain

Case No	Age year	Access in sport	Time of injury	Performance	Diagnoses
46	17	3 years	End of season	2nd group	Lt. calcaneal apophysitis Lt. ulnar tunnel syndrome
47	17	4 years	Mid season	2nd group	Bi. popliteal bursitis
48	17	4 years	Early season	2nd group	Rt. hamstring muscle strain
49	17	4 years	End of season	1st group	Rt. chondromalacia patella
50	17	4 years	End of season	3rd group	Lumbo sacral muscle strain Rt. chondromalacia patella

N.B: The total No. of injuries = 65 (100%)

Rt. = Right

Lt. = Left

Bi. = Bilateal

Table (2) shows soft tissue injuries in senior cyclists

(Group B,n=50 cyclists)

Case No	Age year	Access in sport	Time of injury	Performance	Diagnoses
1	18	3 years	End of season	1st group	Rt. ulnar tunnel syndrome
2	18	3 years	End of season	2nd group	Rt. patellar tendinitis
3	18	3 years	End of season	2nd group	Rt. chondromalacia patella
4	18	3 years	Early season	3rd group	Rt. quadriceps muscle strain Bi. ischial bursitis
5	19	4 years	Mid season	2nd group	Rt. tendo Achillis tendimitis
6	19	5 years	End of season	2nd group	Rt. chondro malacia patella
7	19	5 years	End of season	3rd group	Rt. ulnar tunnel syndrome
8	19	5 years	Early season	3rd group	Lumb sacral muscle strain
9	19	5 years	Mid season	3rd group	Lt. ulnar tunnel syndrome Lt. tendo Achillis tendinitis
10	20	5 years	Early season	3rd group	Rt. hamstring muscle strain
11	20	5 years	End of season	3rd group	Rt. ulnar tunnel syndrome Rt. chondro malacia patella
12	20	5 years	End of season	3rd group	Rt. chondro malacia patella
13	20	6 years	End of season	2nd group	Bi. tendo Achillis tendinitis
14	20	6 years	End of season	3rd group	Rt. patellar tendinits
15	20	6 years	Early season	3rd group	Rt. quadriceps muscle strain
16	20	6 years	Mid season	3rd group	Rt. traumatic knee effusion
17	20	6 years	Early season	3rd group	Rt. hamstring muscle strain Rt. sciatica
18	20	6 years	Early season	1st group	Lumbar muscle strain
19	20	6 years	Early season	1st group	Bi. quadriceps muscle strain
20	20	6 years	End of season	3rd group	Rt. chondromalacia patella
21	20	6 years	End of season	2nd group	Rt. calf muscle strain
22	21	6 years	End of season	3rd group	Rt. ulnar tunnel syndrome Rt. tendo Achillis tendinitis

Case No	Age year	Access in sport	Time of injury	Performance	Diagnoses
23	21	6 years	End of season	1st group	Rt. chondromalacia patella
24	21	7 years	Early season	2nd group	Rt. quadrices muscle strain Rt. patellar tendinitis
25	21	7 years	Early season	2nd group	Lumbar muscle strain Cervical ligament sprain
26	21	7 years	End of season	3rd group	Rt. carpat tunnel syndrome
27	21	7 years	End of season	3rd group	Bi. ulnar tunnel syndrome
28	21	7 years	End of season	1st group	Bi. chondro malacia patellae
29	23	7 years	Mid season	3rd group	Lt. traumatic knee effusion
30	23	7 years	Early season	1st group	Lumbar muscle strain
31	23	7 years	Mid season	2nd group	Rt. ulnar tunnel syndrome
32	23	7 years	Mid season	3rd group	Rt. tendo Achillis tendinitis lumbar muscle strain
33	23	7 years	End of season	2nd group	Rt. chondromalacia patella
34	23	7 years	End of season	3rd group	Lt. chondromalacia patella Rt. adductor tendinitis
35	23	7 years	End of season	3rd group	Rt. chondromalacia patella Rt. tendo Achillis tendinitis
36	24	7 years	End of season	2nd group	Bi. ischial bursitis Rt. sciatica
37	25	7 years	End of season	2nd group	Lt. ulnar tunnel syndrome Lt. tendo Achillis tendinitis
38	25	7 years	End of season	2nd group	Rt. chondromalacia patella Cervical ligament strain
39	25	7 years	End of season	3rd group	Rt. chondromalacia patella Rt. tendo Achillis tendinitis
40	26	8 years	End of season	3rd group	Rt. sciatica Rt. plica patellar syndrome
41	26	8 years	Mid season	3rd group	Rt. retro patellar bursitis
42	26	8 years	Mid season	3rd group	Lumbar muscle strain Cervical ligament sprain
43	26	9 years	End of season	2nd group	Bi. chondro malacia patellae Bi. ulnar tunnel syndrome

Case No	Age year	Access in sport	Time of injury	Performance	Diagnoses
44	28	9 years	Early season	3rd group	Rt. carpal tunnel syndrome Rt. anterior compartmental syndrome
45	28	10 years	End of season	2nd group	Rt. chondromalacia patella Rt. ulnar tunnel syndrome
46	28	10 years	End of season	2nd group	Bi. chondromalacia patellae Lt. sciatica
47	29	11 years	Early season	3rd group	Rt. partial tear of rectus femoris Rt. sciatica
48	30	12 years	End of season	3rd group	Bi. ischial bursitis
49	30	12 years	End of season	3rd group	Rt. iliotibial band syndrome Rt. carpal tunnel syndrome
50	30	12 years	End of season	3rd group	Bi. chondromalacia patellae Bi. tendo Achillis tendinitis

N.B: The total No. of injuries = 75 (100%)

Bi = Bilateral

Rt = Right

Lt = Left

Table (3) Shows the sites of injury in relation to studied groups

Group	Juniors		Seniors	
Site	No.	%	No.	%
LL	40	61.5	51	68.00
UL	15	23.1	14	18.7
Back	10	15.4	10	13.4

$Chi^2 = 0.653$ P> 0.05 N.S.

LL = Lower lilmb
UL = Upper lilmb

The distribution of injuries is not significantly different in both junior and senior groups.

Table (4) Shows the anatomical sites of injury in relation to studied groups

Group	Juniors		Seniors		
Site	No.	%	No.	%	P value
Foot/Ankle	9	13.85	10	15.38	>0.05*
Thigh/Ischium	9	13.85	15	23.08	>0.05
Leg	2	3.08	4	6.15	>0.05
Knee	20	30.77	22	33.85	>0.05
Back	10	15.38	10	15.38	>0.05
Hand/arm	12	18.46	14	21.54	>0.05
Elbow	3	4.61	0	0	>0.05

*** = insignificant**

Table (5) Shows the type of soft tissue injuried among the studied groups

Group	Juniors		Seniors	
Type	No.	%	No.	%
Muscle	12	18.46	17	22.66
Ligament/Joint Tendon	4	6.15	34	45.33
Bursa	8	12.31	3	4
Nerve	5	7.69	19	25.33
Synovial Memb.	0	0	2	2.66
Epiphysis	36	55.38	0	0

Table (6) shows the distribution of injuries in junior cyclists.

No	Type of injury	No of cases	Percentage
1	Tibialapophysitis (fig,23)	12	18.5%
2	Calcaneal apophysitis	9	13.8%
3	Chondromalacia patellae	4	6.2%
4	Hamstring muscle strain	3	4.6%
5	Quadriceps muscle strain	3	4.6%
6	Popliteal bursitis	3	4.6%
7	Calf muscle strain (Gastrocnemius)	2	3%
8	Ischial epiphysitis	2	3%
9	Semimembranosus bursitis	1	1.5%
10	Retropatellar bursitis (fig,24)	1	1.5%
11	Lower ulnar epiphysitis	7	10.8%
12	Ulnar tunnel syndrome (UTS)	3	4.6%
13	Olecranon bursitis	3	4.6%
14	Carpal tunnel syndrome (CTS)	2	3%
15	Dorsal apophysitis	6	9.2%
16	Lumbo sacral muscle strain	4	6.2%

* **(UTS)** Ulnar Tunnel Syndrome.

* **(CTS)** Carpal Tunnel Syndrome.

Table (7) shows the distribution of injuries in senior cyclists.

No	Type of injury	No of cases	Percentage
1	Chondromalacia patellae (fig,25)	15	20%
2	Tendo Achillis tendinitis (fig,26)	10	13.3%
3	Sciatica	5	4%
4	Quadriceps muscle strain	4	5.3%
5	Hamstring muscle strain	3	4%
6	Patellar tendinitis (fig,27)	2	2.7%
7	Ischial bursitis	2	2.7%
8	Traumatic knee effusion	2	2.7%
9	Calf muscle strain (gastrocnemius)	2	2.7%
10	Adductor tendinitis	1	1.3%
11	Plica patellar syndrome (fig,28)	1	1.3%
12	Retro patellar bursitis	1	1.3%
13	Popliteal tendinitis	1	1.3%
14	Iliotibial band syndrome	1	1.3%
15	Anterior compartmental syndrome	1	1.3%
16	Ulnar tunnel syndrome (UTS)	10	13.3%
17	Carpal tunnel syndrome (CTS)	4	5.3%
18	Lumbosacral muscle strain	7	9.3%
19	Cervical ligament strain	3	4%

Table (8) shows the affected side in both junior and senior cyclists

The side of injury	Juniors (No.50)		Seniors (No.50)	
	The number of injuries	Percentage %	Number of injuries	Percentage %
Right side	38	58.5%	45	60%
Left side	12	18.5%	7	9.3%
Bilateral	5	7.7%	12	16%

$Chi^2 = 4.131$ P> 0.05 N.S.

Table (9) shows the relation between performance and injuries

Performance	Juniors (50)		Seniors (50)	
	The number of injuries	Percentage %	Number of injuries	Percentage %
The first group	8	12.3%	6	8%
The second group	18	27.7%	16	21.3%
The third group	24	37%	28	37.3%

$Chi^2 = 0.711$ P> 0.05 N.S.

Table (10) shows the occurance of injuries in relation to season of cycling

Performance	Juniors (50)		Seniors (50)	
	The number of injuries	Percentage %	Number of injuries	Percentage %
Early season	4	6.2%	12	16%
Mid season	14	21.5%	8	10.7%
End of season	32	49.2%	27	36%

$Chi^2 = 5.97$ P< 0.05 Sig.

Table (11) Shows the similar soft tissue injuries in both junior & senior cyclists

No	Type of injury	Juniors		Seniors			
		No.	%	No.	%	Chi^2	P value
1	Chondromalacia patellae	4	6.2	15	20	7.8	<0.01 H.S
2	Carpal tunnel syndrome	2	3	4	5.3	0.17	>0.05 N.S
3	Lumbosacral muscle strain	4	6.2	7	9.3	0.92	>0.05 N.S
4	Ulnar tunnel syndrome	3	4.6	10	13.3	4.33	<0.05 Sig.

H.S. = **Highly significant**

N.S. = **No significant**

Sig. = **Significant**

Fig. (15 A)
The anatomical sites of injuries among the studied groups

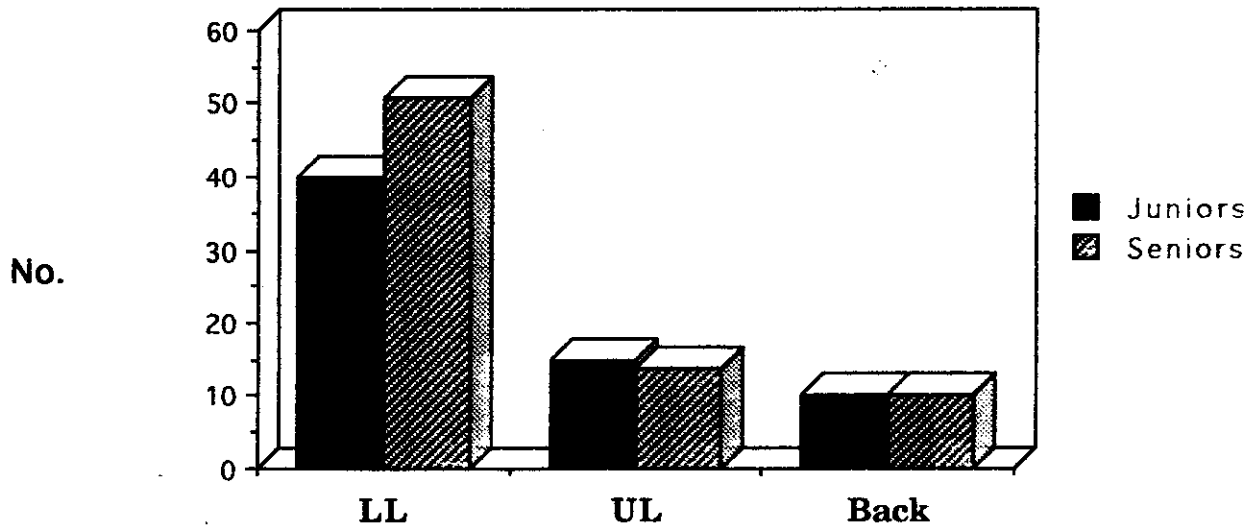

Fig. (15 B)
The anatomical sites of injuries among the studied groups

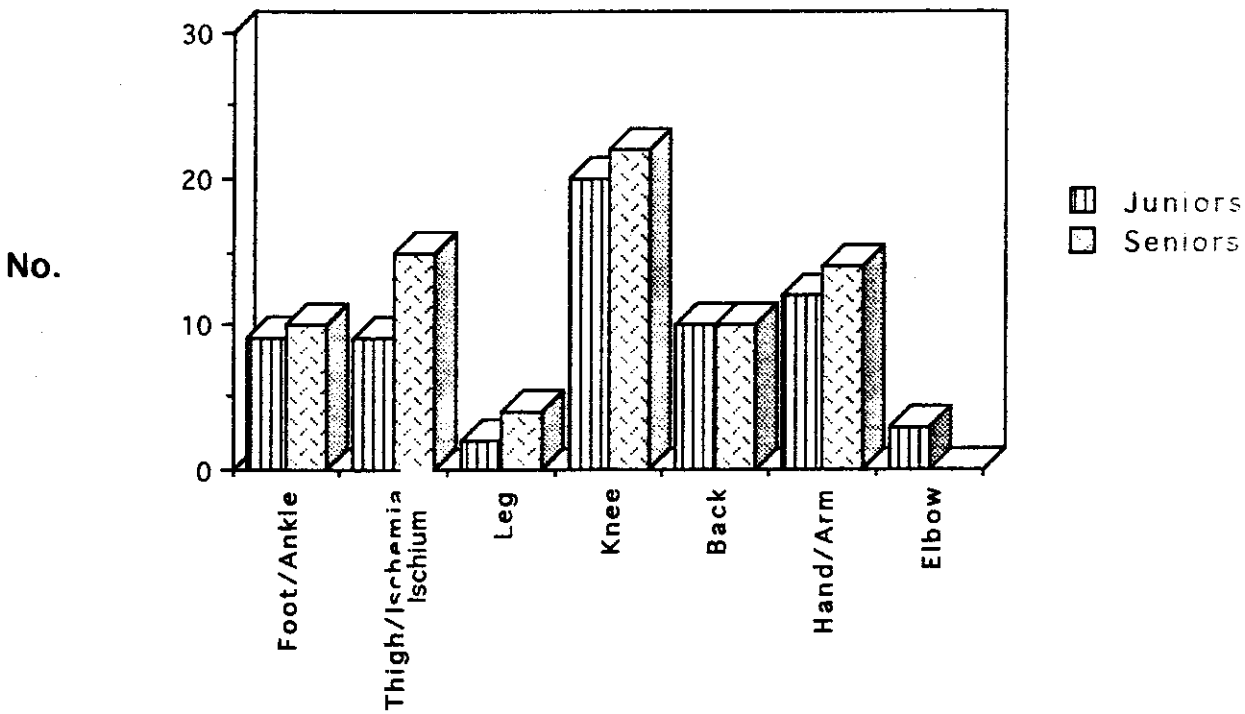

Fig. (16)

Types of soft tissue injuried among the studied groups

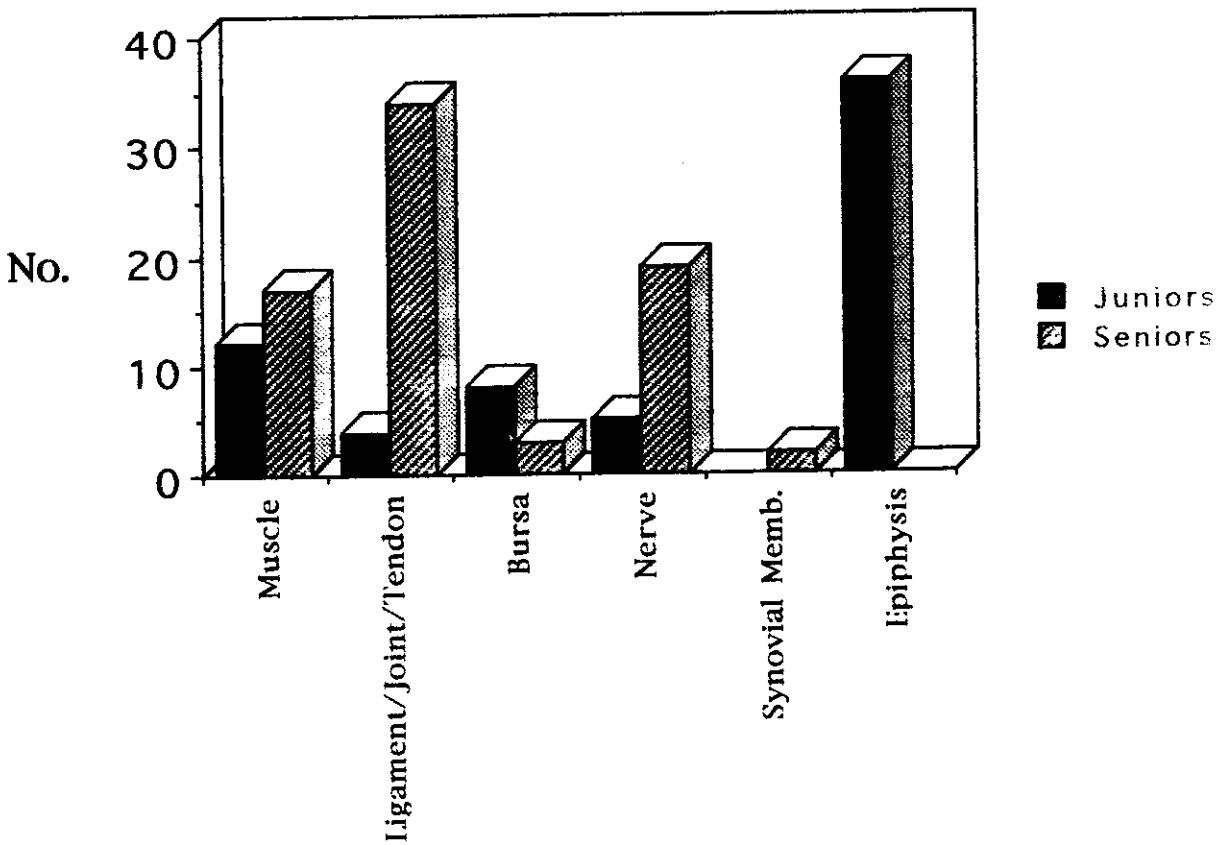

Fig. (17)

Distribution of injuries among Junior cyclists

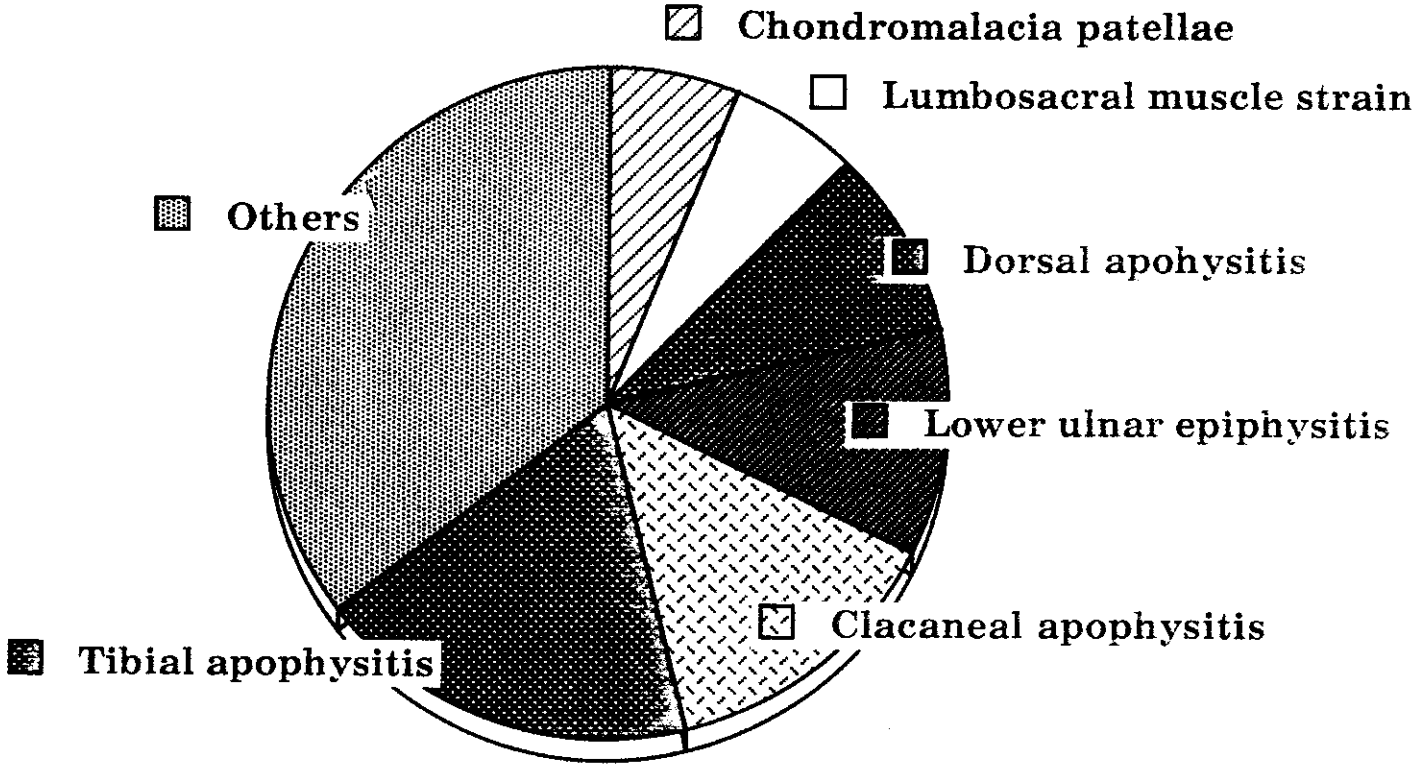

Fig. (18)

Distribution of injuries among Senior cyclists

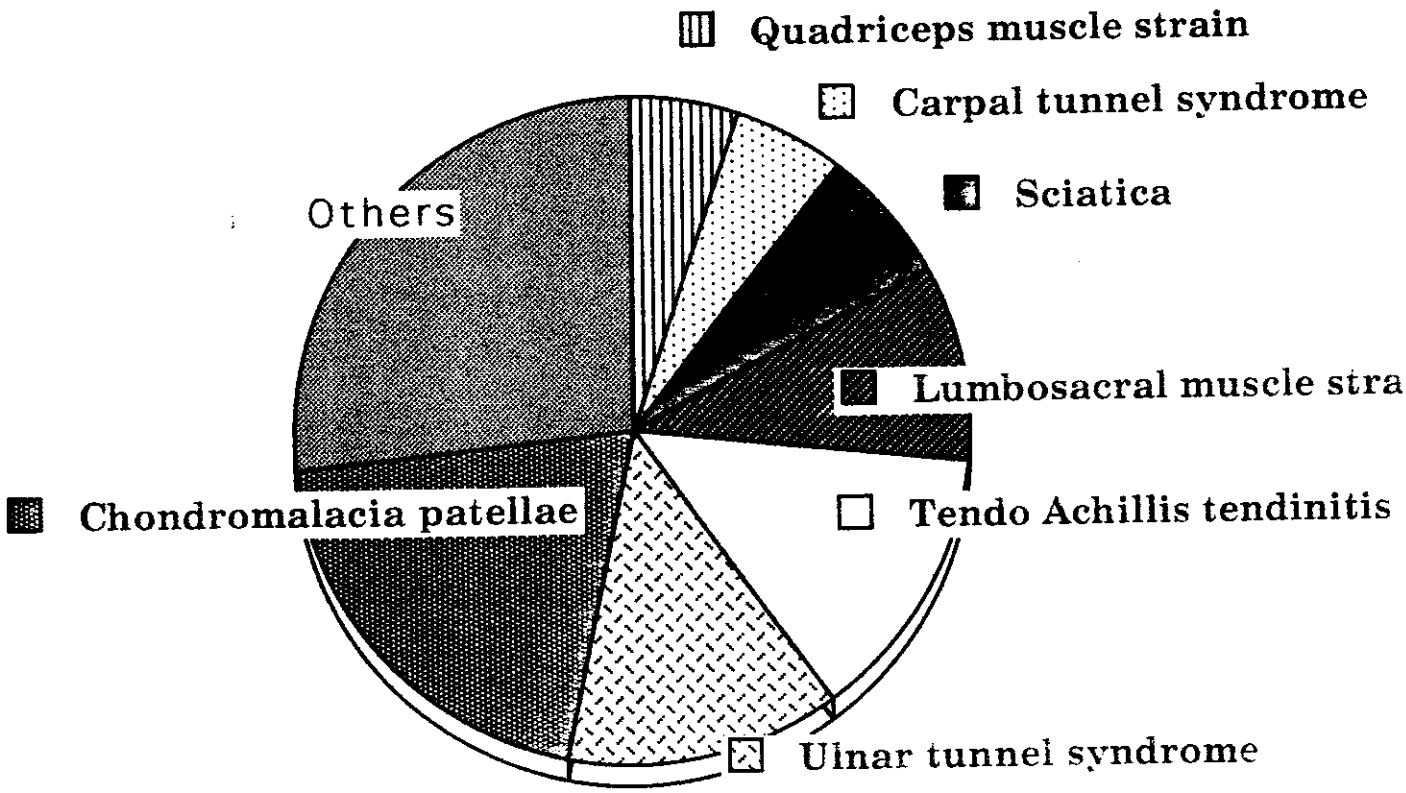

Fig. (19)

The Affected Side in Both Junior and Senior Cyclists

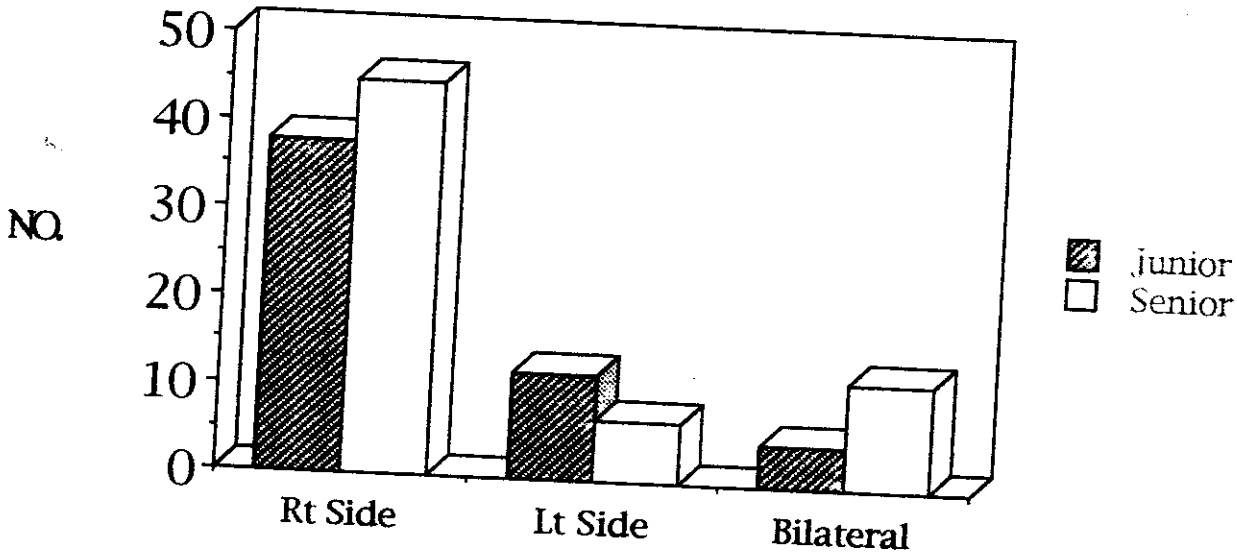

Fig. (20)

The Relation Between The Level of Performance & Injuries

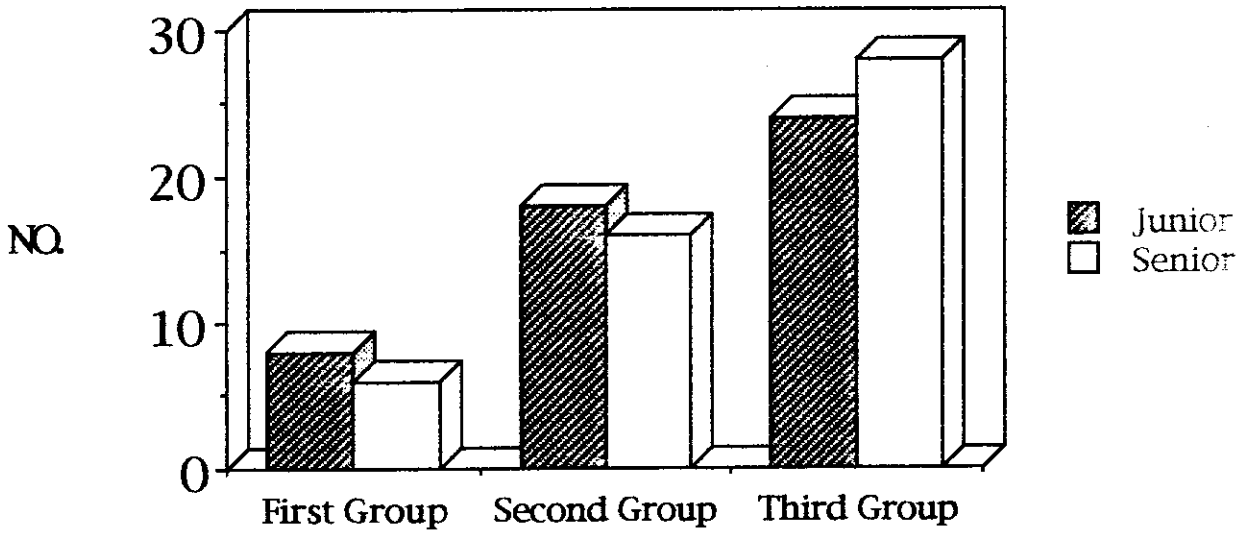

Fig. (21)

The Occurrance of injuries in relation to season of cycling

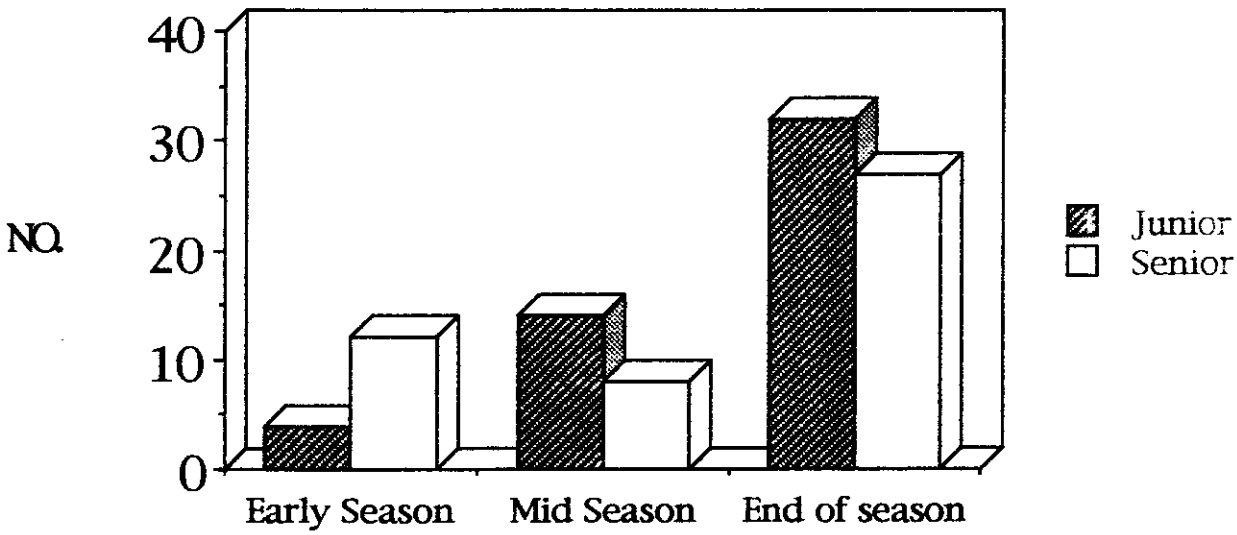

Fig. (22)

Single and combined injuries among the studied groups

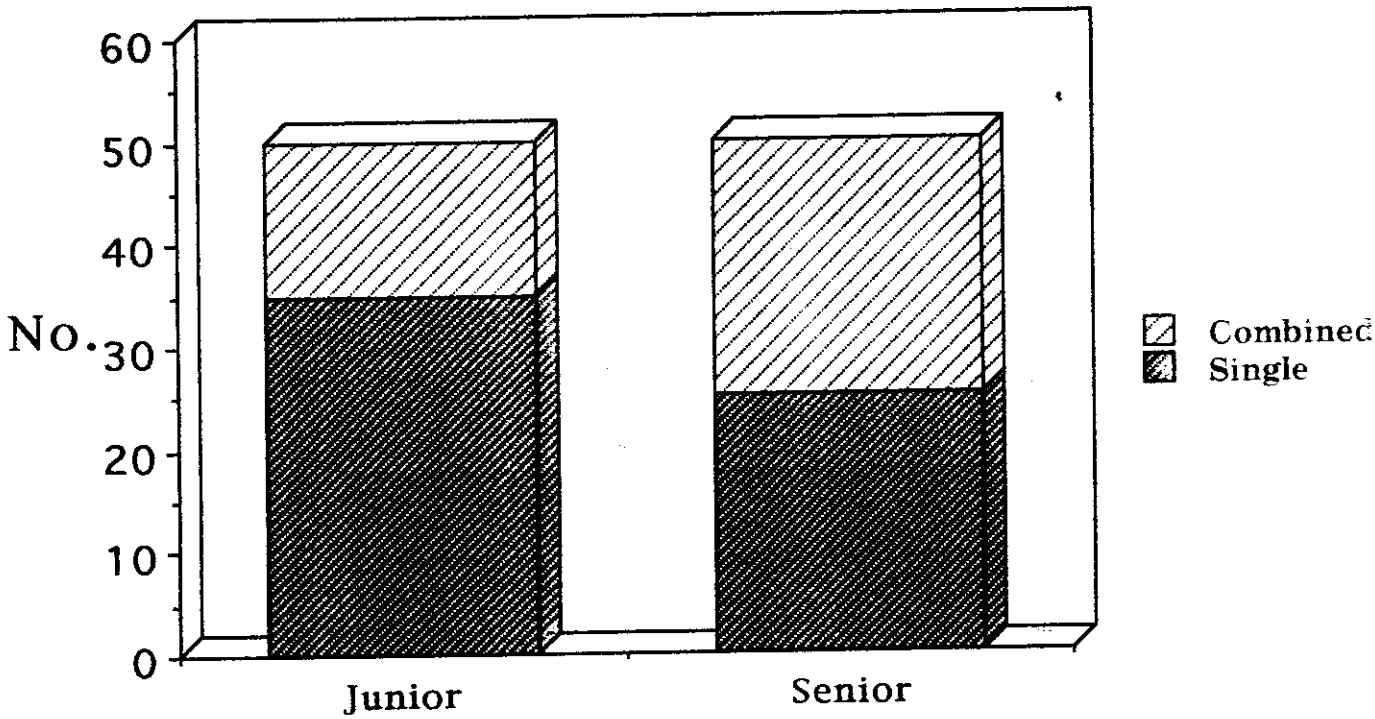

Fig (23) Shows tibial apophysitis

Fig (24) Arthrogram showing patellar retro-bursitis

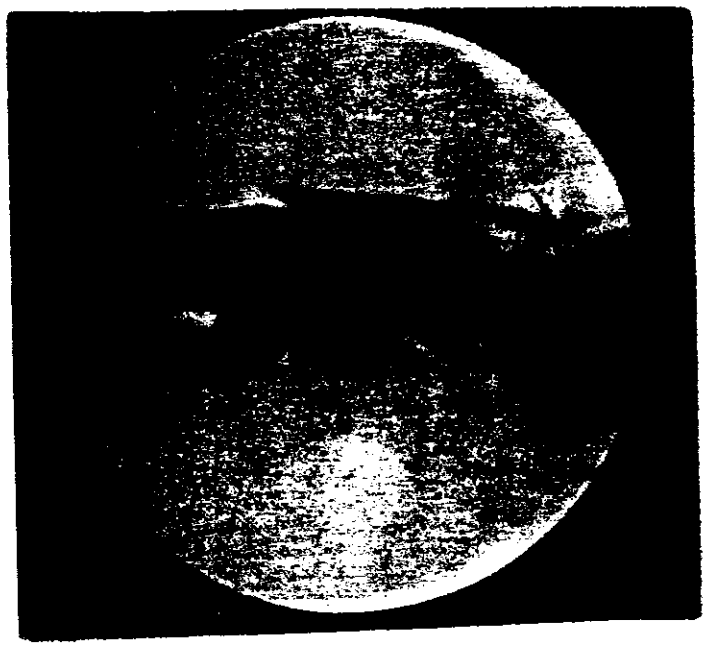

Fig (25) Arthroscopy of the knee showing chondromalecia patella

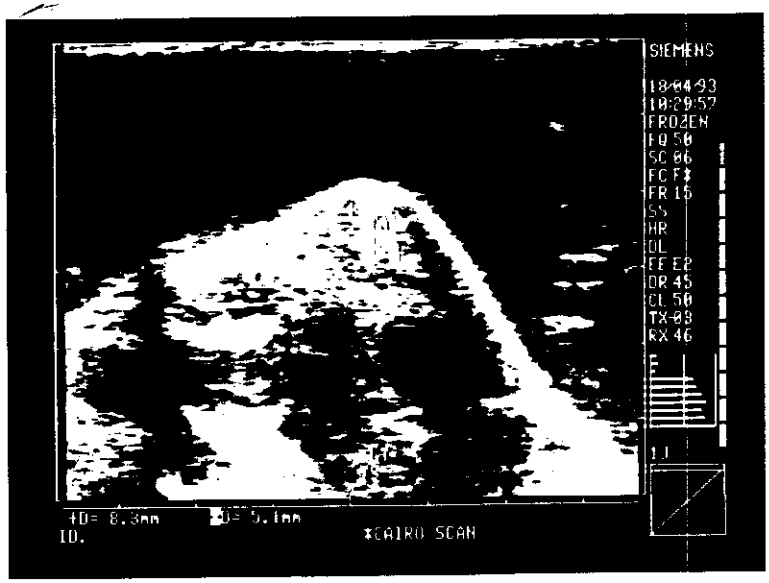

Fig (26) Sonography of tendo Achillis showing tendinitis

Fig (27) Radiogram shows patellar tendinitis

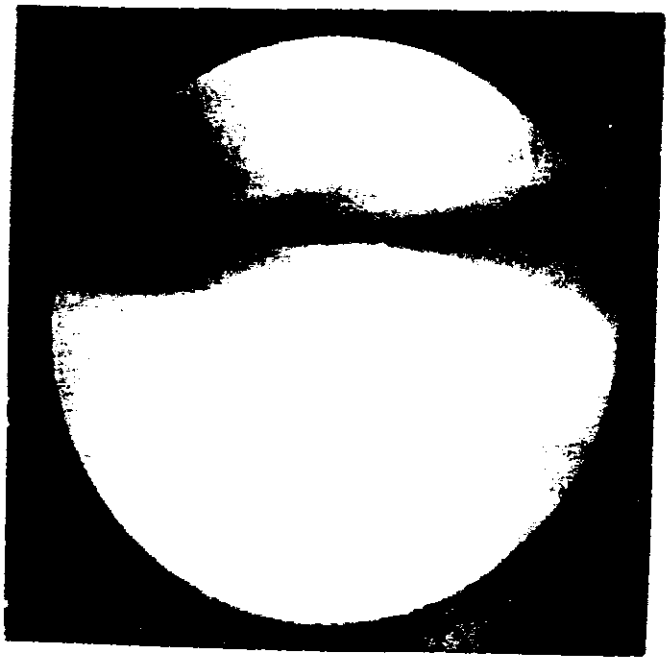

Fig (28) Arthroscopy of the knee showing medial patellar plica syndrome