RESULTS

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The results of this study had been analyzed subjectively and objectively.

Results of subjective assessment

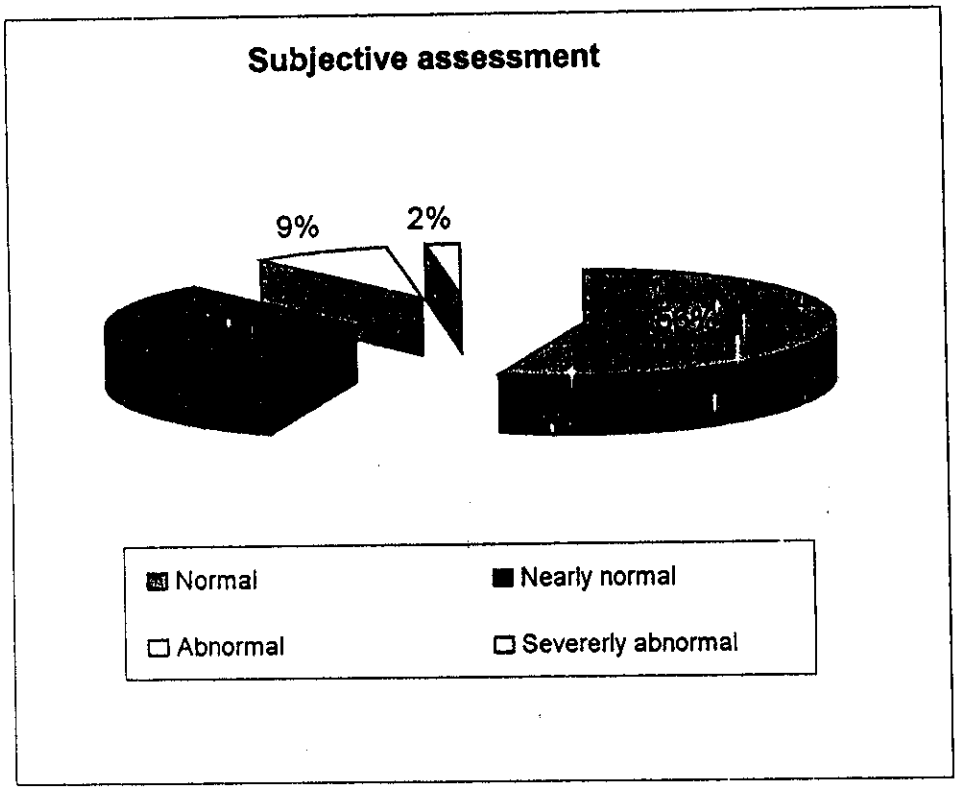
Two years after operation 25 patients (55.6%) scored **A (normal knee)** , 15 patients (33.3%) scored **B (nearly normal).**This means that 40 patients out of 45 scored normal or nearly normal knees(88.9%).Four patients (8.9%) scored **C (abnormal),**and one patient (2.2%) scored **D (severely abnormal)**

Symptoms

The overall result of postoperative symptoms (including pain, swelling, and partial and complete giving way) is that 22 patients (48.9%) were free of symptoms; 17 patients (37.8%) complained of mild Symptoms, 5 patients (11.1%) were moderately complaining, and one patient (2.2%) complained of severe incapacitating pain and swelling due to postoperative arthrofibrosis.

a) **Pain:**

Fifteen patients (33.3%) complained of knee pain during the first 3 months postoperatively; eleven of them (24.4%) were of the group that had tear of the medial and or lateral meniscus, which was treated by partial or subtotal meniscectomy. Pain was aching in character, increased with weight bearing and respond well to non-steroidal anti-inflammatory. One of the patients (2.2%) was due to intra-articular infection and adhesion (infective arthrofibrosis), and the last 3 cases (6.7%) were due to patellar tendinitis.



Fig(35) Patient's subjective assessment

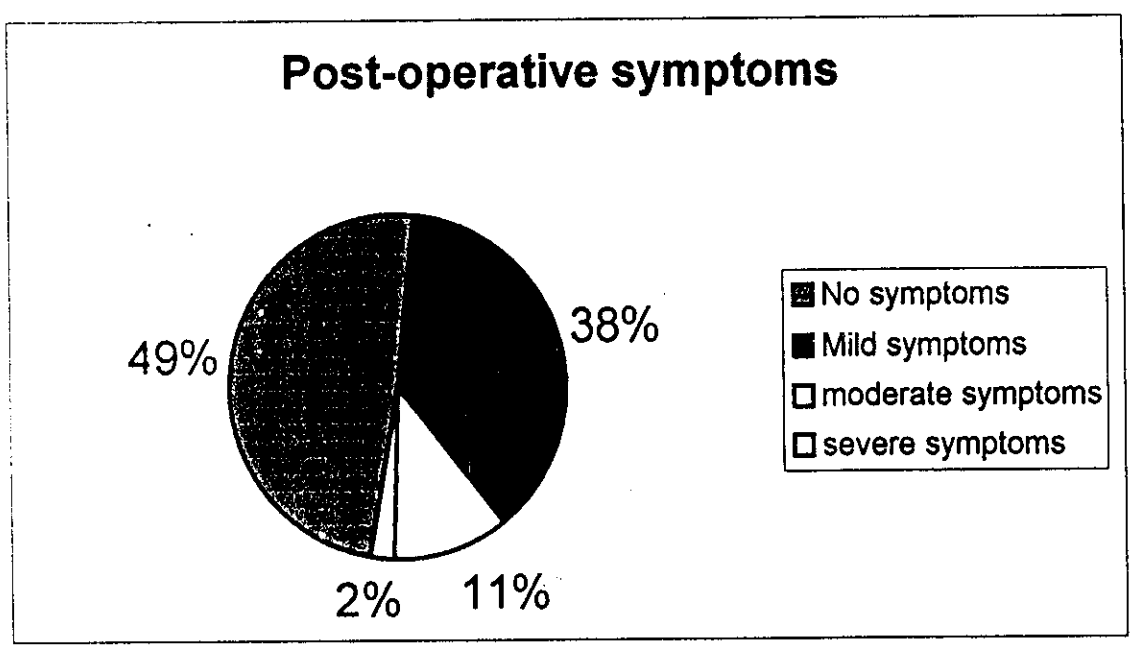


Fig.(36) post-operative symptoms

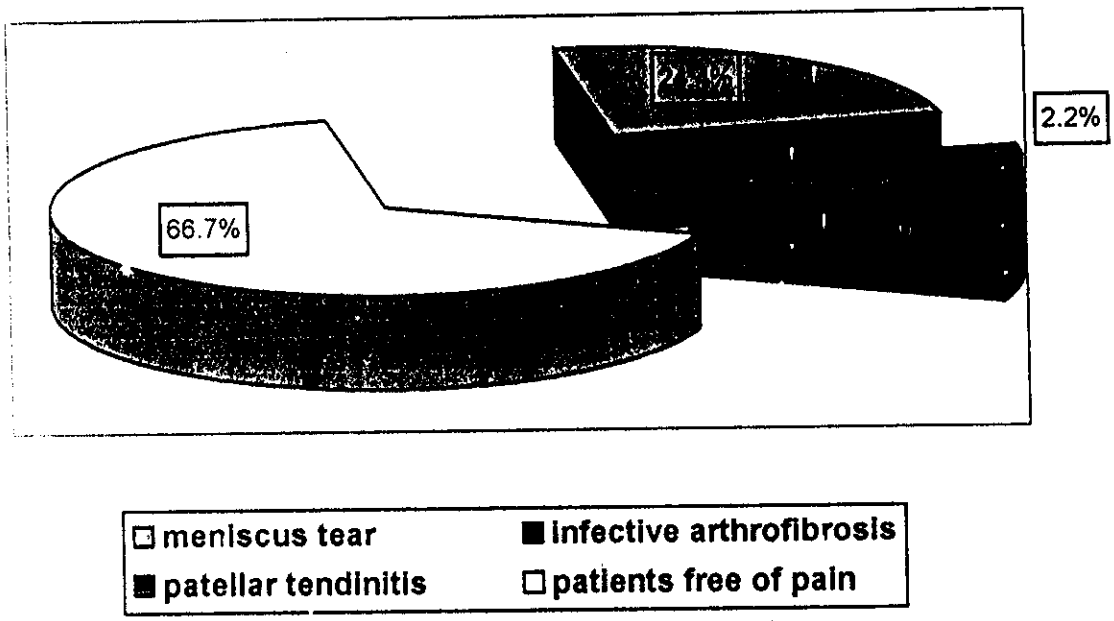


Fig. (37) postoperative pain

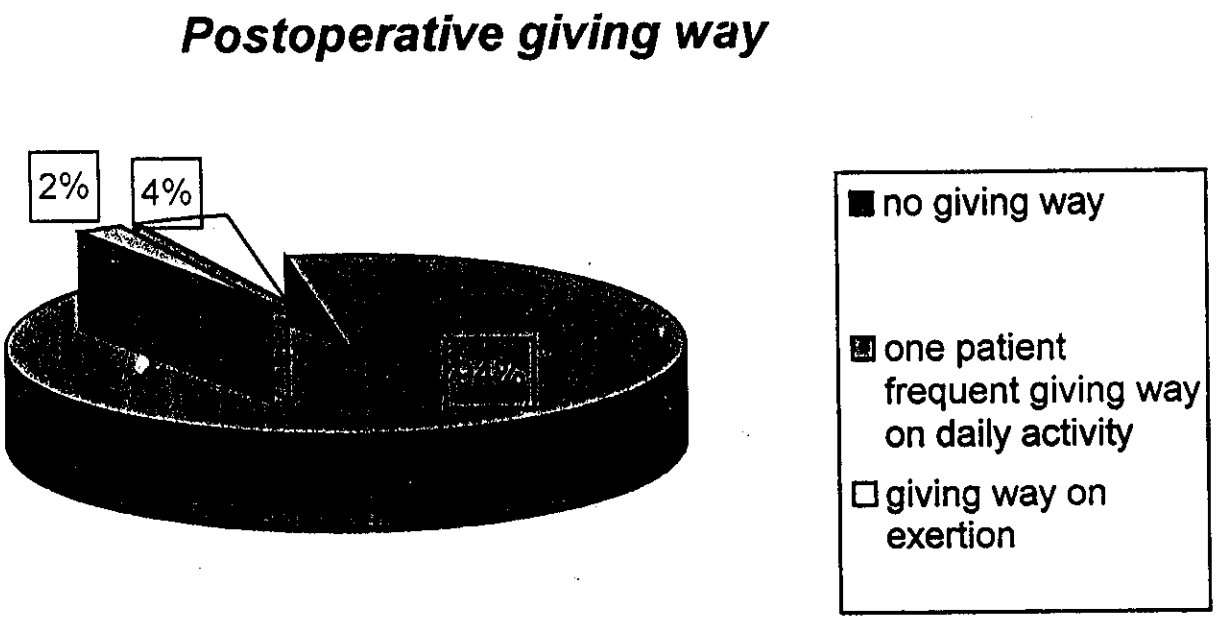


Fig (38)Post-operative giving way

b) Giving way

Two years post operatively 42 patients had no any attacks of giving way (93.3%), but one patient (2.2%) had a frequent attacks of giving way on daily activity, and 2 patients (4.4%) had giving way on severe exertion. The patient had a felling if insecurity and had to guard against giving way.

This in comparison to preoperative that all the 45 patients suffered from giving way (l00%), 33 patient (73.3%) with daily activities and 12 patients (26.7%) with severe exertion.

c) Swelling

Five patients had attacks of knee swelling, 4 cases of them were effusion and needed to be aspirated. The fifth case was due to synovitis and synovial thickening and responds to rest, non-steroidal anti-inflammatory drugs, and knee brace. Two years postoperative non-of the patients had any persistent knee swelling (whether synovial thickening or effusion).

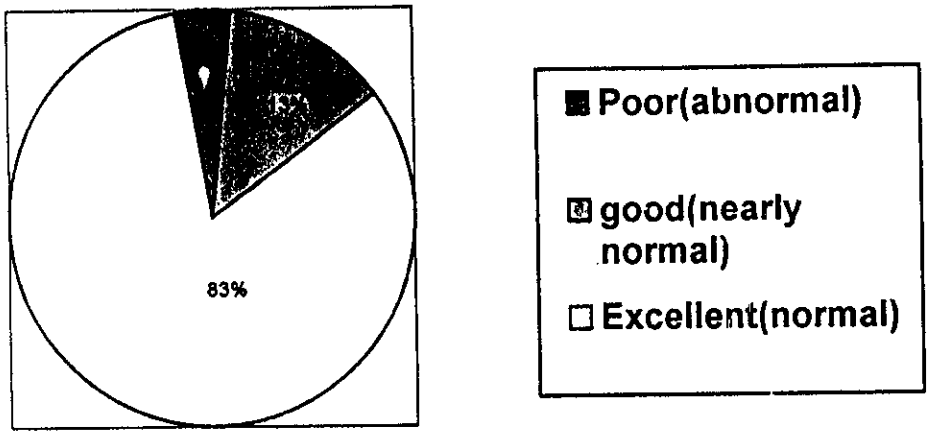
d) Activity level (compared with pre injury level)

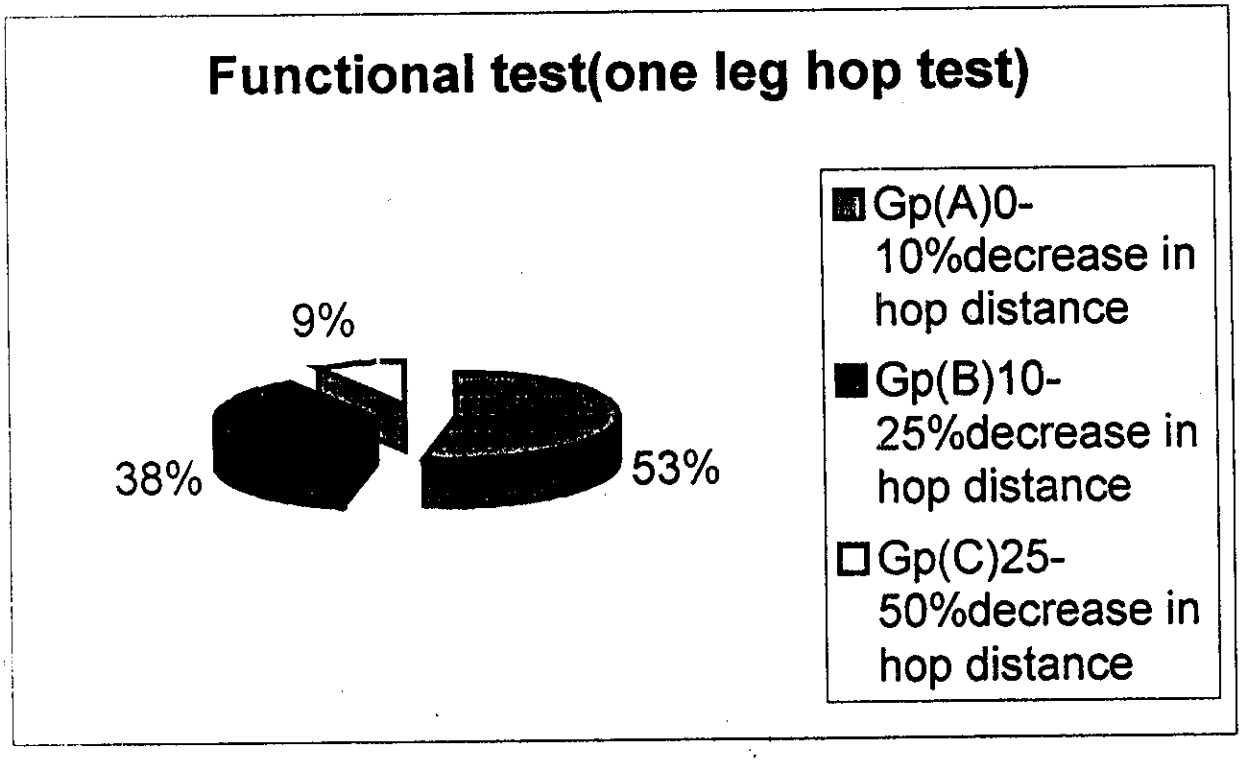
In 37 patients (82.2%) no change in activity level than before the surgery which were graded as an excellent. Six patients (13.3%) returned to the same sports but with lower performance than before surgery (nearly normal) which was graded as a good. Both groups considered satisfactory results .Two patients (4.4%) do not share in sports activity(as before surgery)which was graded as poor.

e) Functional Test (one leg hop test)

In 24 patients (53.3%) there was 0-10% decrease in the forward hop distance, which were graded as an excellent (A). Seventeen patients (37.8%) showed 10-25% decrease in the forward hop distance (B). And 4 patients (8.9%) were 25-50% decrease in the forward hop distance (C).

Fig (39): Activity level (compared with pre-injury level).





Fig(40) results of one leg hop test

f) Harvest site pathology

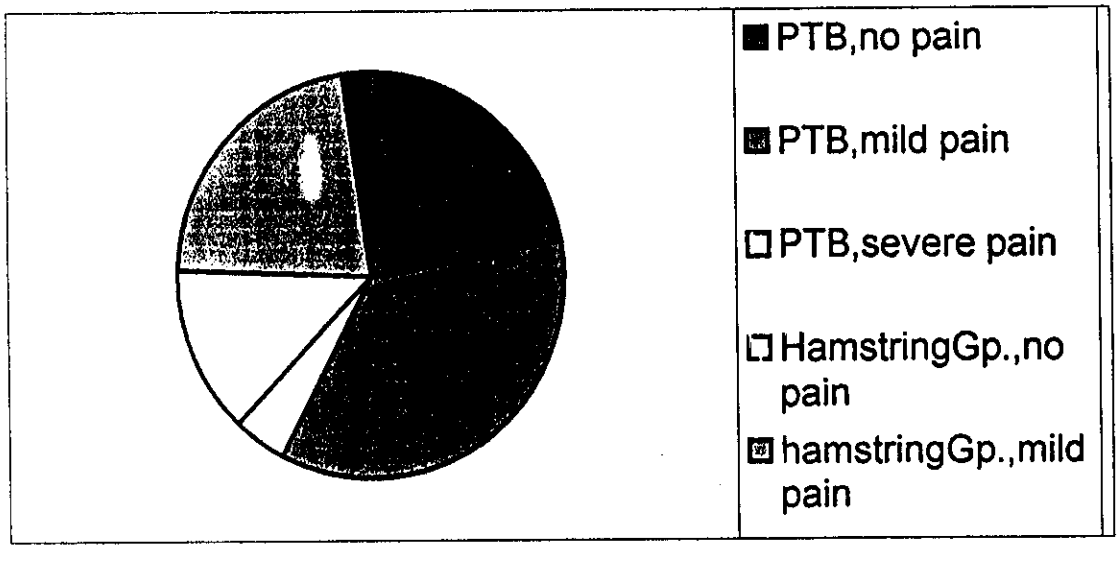
This is divided into 2 subgroups:

a)Patellar tendon autograft subgroup

Tenderness at the tip of the patella (anterior knee pain) was graded as group (A), no tenderness in 10 patients (35.7%of PTB subgroup, and 22.2%of all cases), Group (B), Mild tenderness was present in 16 patients (57.1%of PTB subgroup, and 35.6% of all patients). Two patients7.1%of PTB subgroup, and4.4%of all patients) had moderate knee pain group(C).

b) Hamstring tendon autograft subgroup

Tenderness at the postero-medial aspect of the knee was also grouped as group (A), no pain in 6 patients (35.3%of hamstring tendon subgroup, and 13.3%of all patients). Group (B) mild pain in 10 patients (58.8%of hamstring tendon subgroup and 22.2%of all patients). The last patient (5.9%of hamstring tendon subgroup ,and 2.2% of all patients) had moderate knee pain (C).



Fig(42) Harvest site pain

Results of objective assessment

a) Lachman test

Two years post operative, 34 patients (75.6%) were negative for Lachman test, that were graded as an excellent, while 8 cases (17.8%) were one plus, that were graded as a good. Both groups 42 patients (93.4%) were graded as satisfactory, two patients (4.4%) were two plus which was graded as abnormal; and one case (2.2%) three plus which was graded as severely abnormal .The last two groups account for (6.6%) of all patients.

In comparison to pre operative Lachman test, 2 patients (4.4%) were one plus, good or satisfactory while 31 patients (68.9%) were two plus, fair and 12 patients (26.7%) were 3 plus or poor results. Both groups 30 cases (95.6%) considered unsatisfactory.

b) Pivot shift

Two years post operative, 36 patients (80%) were negative for pivot shift, that were graded as an excellent. Six cases (13.3%) were one plus, that were graded as a good, both groups 42 patients (93.3%) were graded as satisfactory. Two patients (4.4%)were two plus which was abnormal , and one patient (2.2%) was three plus which was graded as severely abnormal.

In comparison to pre operative pivot shift, 37 patients (82.2%) were 2 plus, and 8 patients (17.8%) were three plus.

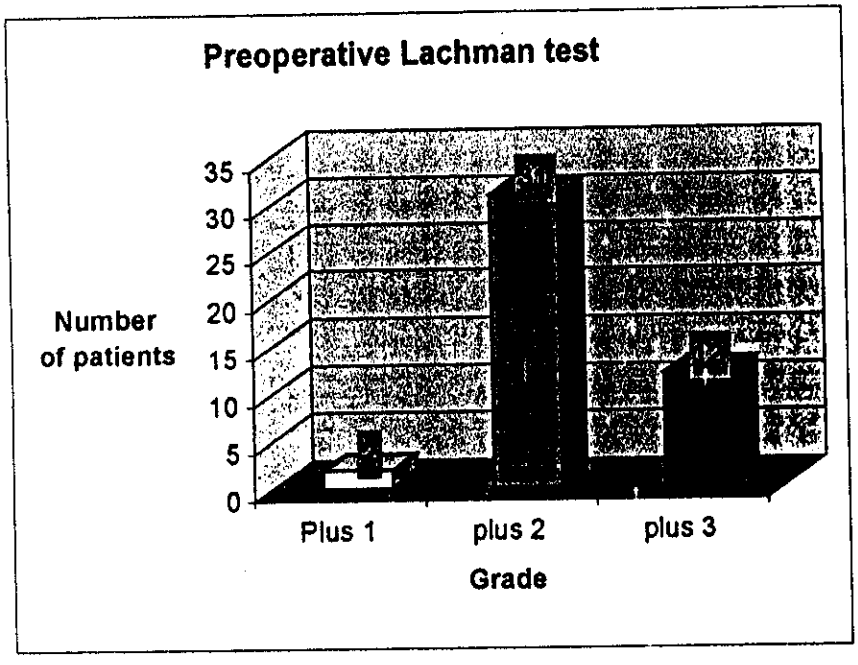


Fig (43) Pre -operative Lachman test

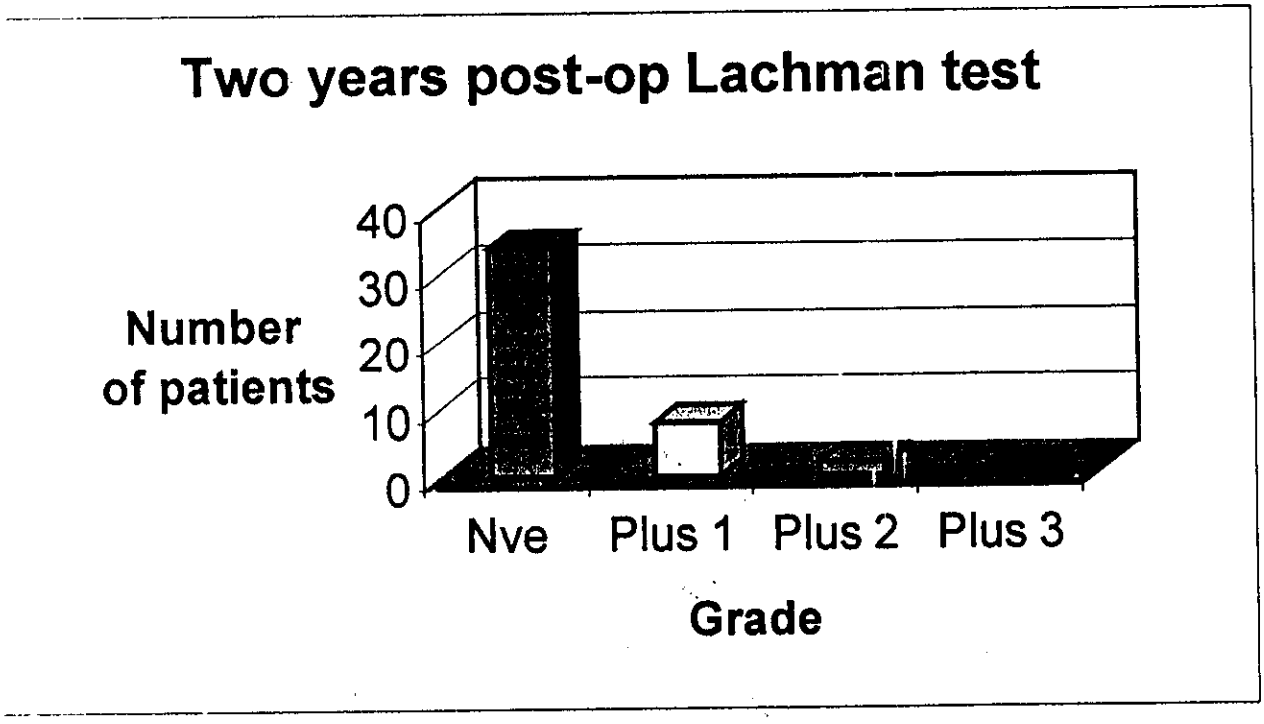


Fig (44)post-operative Lachman test

c) Anterior drawer test:

Two years postoperative, 32 patients (71.1%) were negative for anterior drawer test, that were graded as an excellent, while 10 cases (22.2%) were one plus with hard end point, that were graded as a good. Both groups 42 cases (93.3%) were graded as satisfactory. Two patients (4.4%) were grade two (abnormal), and one case (2.2%) grade 3(severely abnormal), both groups (6.7%) were graded as unsatisfactory.
In comparison to the preoperative ADT, 39 cases (86.7%) were two plus, and 6 patients (13.3%) were three plus.

d) Range of motion

Pre operative range of motion, 38 patients (84.4%) had full extension range. Seven patients (15.6%) had loss of 5-10° of extension due to locking of the knee as result of meniscal injury.
As regard the flexion range preoperative all patients (100%) had a full range of flexion.

Postoperatively, forty-two patients (93.4%) had the ability to flex their knee full range at 6 months, which were graded as satisfactory.

Two patients (4.4%) had loss of last 10° of flexion (abnormal). One patient had a range of 90° flexion by the 3rd month post operative (2.2%) which was treated by arthroscopic arthrolysis at the 6th month post operative the end result was loss of the last 20° of flexion (severely abnormal).

Final assessment

The final results of our thesis were grouped into four groups according to IKDC score system as follows

Group (A) completely normal

Twenty-two patients of our patients were normal two years post-operatively (48.9%); eight of them were of hamstring tendon subgroup (47.1% of 17 patients attending hamstring reconstruction).The remainder 14 patients were from BTP subgroup (50% of BTP subgroup).

Group (B) nearly normal

Seventeen patients of our patients were nearly normal two years post-operatively (37.8%); seven of them were of hamstring tendon subgroup (41.2% of 17 patients attending hamstring reconstruction). The remainder 10 patients were from BTP subgroup (35.7% of BTP subgroup). Both groups A and B are considered satisfactory results, both account for 86.7% of all cases.

Group (C) abnormal

Only 5 patients (11.1%) were abnormal and could not return to previous activity; two of them were of hamstring subgroup (11.8% of hamstring subgroup) and three (10.7% of BTP subgroup).

Group (D) severely abnormal

Only one patient (2.2%of all cases, and 3.6%of BTP subgroup) was severely abnormal because of post-operative infection and later on arthrofibrosis

The last 2 groups C and D account for 13.3% of all cases , and were considered unsatisfactory results.

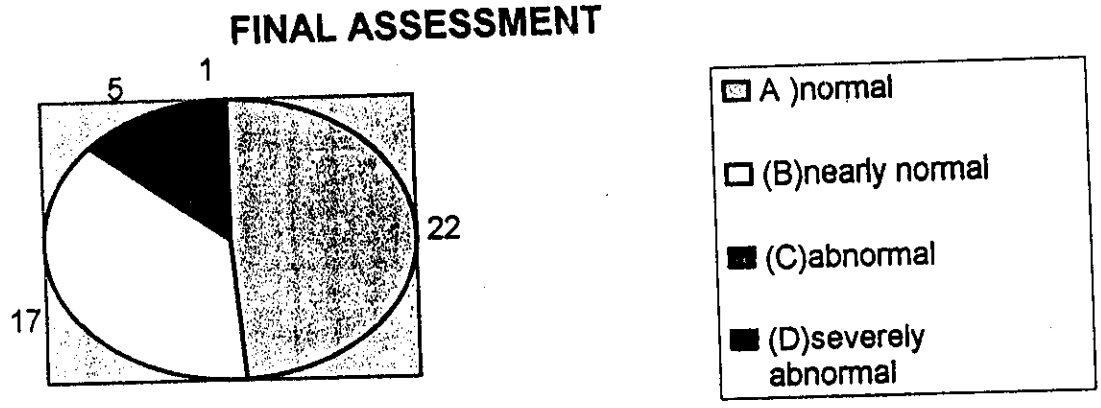


FIG (45) FINAL ASSESSMENT

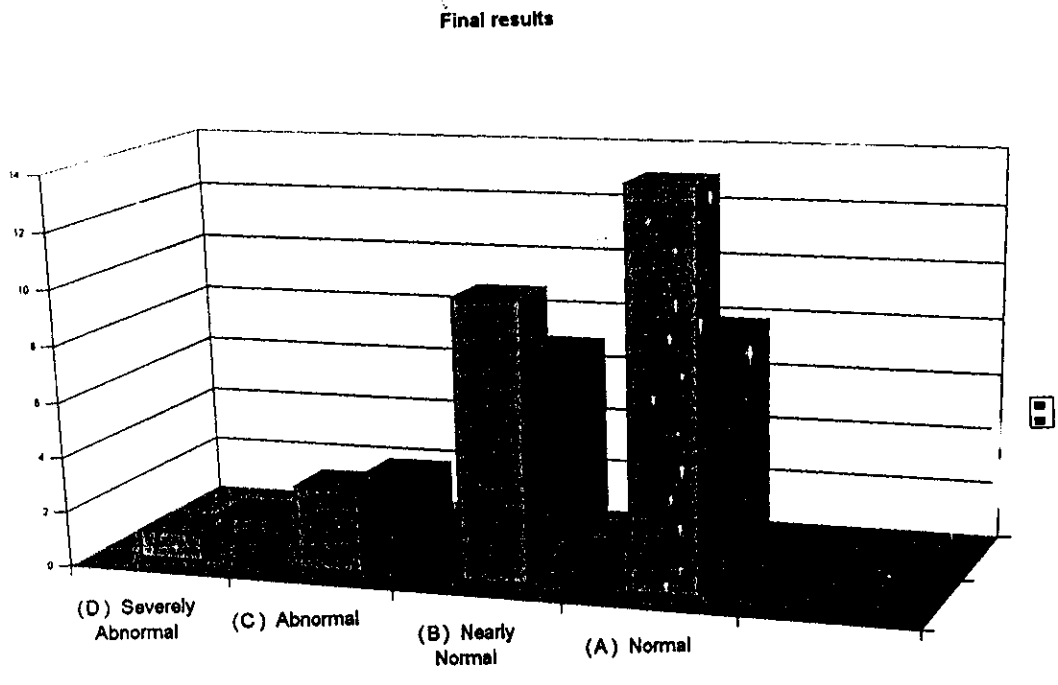


FIG (46)DETAILED FINAL ASSESSMENT

STATISTICAL ANALYSIS OF THE RESULTS

The material and the results of this study were analyzed by using personal computer (microstat program)to reach the mean and standard diviation ; the Z=value equation is achieved manually with the help of a calculator.the Z value equation is :

$$Z = \frac{P1 - P2}{\sqrt{\frac{p1(100-p1)}{n_1} + \frac{P2(100-P2)}{n2}}}$$

then if, $Z > 4.5$ P (propability of error) <0.01 meaning statistically highly signnificant difference.

If Z >or equal 1.96 ,P < 0.05 ,Significant difference.

If Z < 1.96 , P > 0.05 , statistically insignnificant difference.

Table (22): Statistical analysis of Lachman test.

* Lachman test	Preoperative		Postoperative		
	No.	%	No.	%	P-VALUE
0	0	0	34	75.6	Z=4.616429 P<0.01 **Highly Significant**
+	2	4.4	8	17.8	Z =0.6757557 P>0.05 **NS.**
++	31	68.9	2	4.4	Z=3.8584571 P<0.05 **S.**
+++	12	26.7	1	2.2	Z=0.7625432 P>0.05 **NS.**
Total	**45**	**100**	**45**	**100**	

Table (23): Statistical analysis of pivot shift test

Pivot shift test	Preoperative		Postoperative		Z	P
	No.	%	No.	%		
0	0	0	36	80	4.75861	P<0.01 H.S
+	0	0	6	13.3	0.43271	P>0.05 NS
++	37	82.2	2	4.4	2.214192	P<0.05 S.
+++	8	17.8	1	2.2	0.4636931	P>0.05 NS.
Total	**45**	**100**	**45**	**100**		

Table (24): Statistical analysis of ADT

ADT	Preoperative		Postoperative		P-value
	No.	%	No.	%	
0	0	0	32	71.1	**Z**=3.9933859 **P**<0.05 **S.**
+	0	0	10	22.2	**Z** 0.760863 **P**>0.05 **N.S.**
++	39	86.7	2	4.4	**Z**=2.38890 **P**<0.05 **S.**
+++	6	13.3	1	2.2	**Z**=0.32997 **P**>0.05 **NS.**
Total	**45**	**100**	**45**	**100**	

Table (25): Statistical analysis of extension range.

Test	Preoperative		Postoperative		P-value
Range of motion *Extension	Nc.	%	No.	%	
Full range (<3° loss)	38	84.4	39	86.7	Z=0.1247902 P>0.05 **N.S.**
Loss of 3-5°	0	0	3	6.7	P>0.05 **N.S.**
Loss of 6-10° of last extension	7	15.6	2	4.4	Z=0.2504979 P>0.05 **N.S.**
Loss of more 10°	0	0	1	2.2	P>0.05 **N.S.**
Total	**45**	**100**	**45**	**100**	

Table (26): Statistical analysis of flexion range.

Test	Preoperative		Postoperative		P-value
* Flexion	No.	%	No.	%	
Full range	45	100	42	93.3	Z=0.7776204 **P >0.05 N.S.**
Loss of last 10°	0	0	2	4.4	N.S.
Loss of last 20°	0	0	1	2.2	N.S.
Total	**45**	**100**	**45**	**100**	

Table (27): Statistical analysis of Thigh girth.

	Preoperative		Postoperative		P-value
* Thigh girth	No.	%	No.	%	
Eqaull	20	44.4	37	82.3	Z=1.3323501 P>0.05 **N.S.**
Less than 1 cm Dif.	5	11.1	3	6.7	Z=0.0992916 P>0.05 **N.S.**
1 cm Dif.	9	20	2	4.4	Z=0.4727907 P>0.05 **N.S.**
1.5 cm Dif.	7	15.6	2	4.4	Z=0.2504979 p>0.05 **N.S.**
2 cm Dif.	4	8.9	1	2.2	Z=0.147617 P>0.05 **N.S.**
Total	**45**	**100**	**45**	**100**	

Table (28): Statistical analysis of giving way.

* Giving way	Preoperative		Postoperative		P-value
	No.	%	No.	%	
No	0	0	42	93.3	Z=2.8210639 P<0.05 **S.**
Apprehension	0	0	1	2.2	**Z**=0.0681756 P>0.05 **N.S.**
on severe exertion	12	26.7	1	2.2	Z=0.5655905 P>.05 **N.S.**
During daily activity	33	73.3	2	4.4	Z=1.8879066 P>0.05 **N.S.**
Total	**45**	**100**	**45**	**100**	

Table (29): Statistical analysis of pain

Site pain	Pre operative		After 3 month		after 1 year	
	No.	%	No.	%	No.	%
No pain	18	40	30	66.6	42	93.3
Medial	6	13.3	3	6.7	0	0
Lateral	1	2.2	0	0	0	0
Medial & Lateral	4	8.9	2	4.4	0	0
Diffuse	16	35.6	7	15.6	1	2.2
Retro-patellar	0	0	3	6.7	2	4.4
Total	**45**	**100**	**45**	**100**	**45**	**100**

COMPLICATIONS

One case (2.2%) had a severe intra-articular infection, which was drained on 3rd post operative day and ended with persistence flexion deformity (Arthrofibrosis). This was managed by arthroscopic arthrolysis at the 3rd month postoperative.

Four patients (8.9%) had a collecting haematoma intra-articular, and were evacuated on the 3rd postoperative day.

Three cases (6.7%) were complicated with superficial infection at the incision, they were respond well to repeated dressing and specific antibiotics.

Four Patients had a significant knee effusion and aspirated, the effusion was completely resolved after aspiration, knee brace and non-steroidal anti-inflammatory, when the fluid aspirated it was clear synovial fluid.

Two patients had a femoral tunnel screw diversion and discovered by plain x-ray postoperative. The screw was left in place and the postoperative program of rehabilitation was done as other patients and the out come of the result was satisfactory.

Parasethesia on the anterolateral aspect of the knee was noticed in 9 patient (20%), that was due to injury of the infra patellar branch of saphenous nerve, this complaint disappeared completely 6-9 months postoperative.