Results

Results

From the patients data of both the conventional group and the lymphadenectomy group the following tables have been designed:

(N.S) : non significant. & (S.) : significant.

Table *(4): The patients (pts.) characteristics in both groups:*

Character		Conventional (30)		Lymphadenectomy (30)		P Value*
		No	%	No	%	
sex	Male	17	58.6 %	19	63.3 %	0.711 (N.S)
	Female	13	41.4 %	11	36.7 %	
age	Mean ± SD	(48.55± 13.86)		(51.40± 13.21)		0.792 (N.S)
	Range	(25– 70)		(25– 72)		

** Fisher's exact test.*

Age:

- The age range in the conventional group was (25 – 70) years with mean of (48.5) years.
- The age range in the lymphadenectomy group was (25 – 72) years with mean of (51.4) years.

Sex:

- As regards the sex we had 17 (58.6%) males and 13(41.4%) females in the conventional group versus 19(63.3%) males and 11(36.7 %) females in the lymphadenectomy group.
- The male to female ratio in the conventional and lymphadenectomy cases was 1.2 and 1.6.
- There is no significant difference between the two groups as regards the age & sex.

Table (5): *Gross pathological characteristics in both groups:*

Gross pathology		*Conventional (30)*		*Lymphade. (30)*		*P. value*
		No.	*%*	*No.*	*%*	
Site	Upper	1	3 %	3	10.0 %	
	mid	14	47 %	10	33.3 %	0.46
	lower	15	50 %	17	56.7 %	(N.S)**
Size	< 5Cm	12	40 %	11	36.7 %	0.438
	> 5 Cm	18	60 %	19	63.3 %	(N.S)**
Morphology	Exophytic	14	46.7 %	18	60.0 %	0.438
	Non exoph.	16	53.3 %	12	40.0 %	(N.S)*

**** Fisher's exact test.*** ***** Chi- Square Likelihood Ratio test.***

There is no significant difference between the two groups as regards the gross pathology of the tumours.

Table (6): *Histopathological characteristics of both groups.*

Gross pathology		Conventional (30)		Lymphade. (30)		P. value
		No.	%	No.	%	
Type	Adenocarc.	15	50 %	21	70 %	0.187
	Mucoid	15	50 %	9	30 %	(N.S)*
Grade	II	20	66.7 %	21	70 %	0.780
	III	10	33.3 %	9	30 %	(N.S)**
Lymph.	Absent	15	50.0 %	14	46.7 %	0.786
Invasion	Present	15	50.0 %	16	53.3 %	(N.S)**
Vascular	Absent	21	70.0 %	19	63.3 %	0.585
invasion	Present	9	30.0 %	11	36.7 %	(N.S)**
Perineural	Absent	23	76.7 %	23	79.3 %	0.806
invasion	Present	7	23.3 %	6	20.7 %	(N.S)**
Submucous	Absent	27	90.0 %	28	93.3 %	0.639
extention	Present	3	10.0 %	2	6.7 %	(N.S)**
Synchronus	Absent	29	96.7 %	28	93.3%	0.550
polyps	Present	1	3.3 %	2	6.7%	(N.S)**

** Fisher's exact test.* *** Chi- Square Likelihood Ratio test.*

There is no significant difference between the two groups as regards the histopathological characteristics of the tumours.

Table (7): ***Operation type in both groups:***

Operation	*Conventional (30)*		*Lymphaden.(30)*		P. value
	No.	%	No.	%	
Abdomino-perineal resection (APR)	15	50.0 %	13	43.3 %	
Anterior resection (AR)	12	40.0 %	9	30.0 %	
AR with defunctioning colostomy	1	3.3 %	2	6.7 %	
AR with coloplasty	0	0.0 %	2	6.7 %	0.317
Hartmann's operation	2	6.7 %	1	3.3 %	(N.S.)**
APR with Bilat. oophrectomy	0	0.0 %	1	3.3 %	
Total proctocolectomy	0	0.0 %	1	3.3 %	
APR with hysterectomy (posterior pelvic excentration)	0	0.0 %	1	3.3 %	

***** Chi- Square Likelihood Ratio test.***

There is no significant difference between the two groups as regards the conventional part of the type of surgery done.

Table (8): Dukes' staging in both groups:

Staging		Conventional		Lymph		P. value *
		No.	%	No.	%	
	Dukes' A	2	6.7 %	2	6.7 %	0.360 (N.S.)
	Dukes' B_1	7	23.3 %	9	30.0 %	0.539 (N.S.)
	Dukes' B_2	8	26.7 %	4	13.3 %	0.673 (N.S.)
	Dukes' C	13	43.3 %	15	50.0 %	0.584 (N.S.)

**** Fisher's exact test.***

There is no significant difference between the two groups of regards the Dukes' staging.

Table (9): ***Operative data in both groups:***

		Conventional(30)	Lymphadec.(30)	P. value ***
Oper. time	Mean ± SD	(2.92 ± 0.55)	(3.29 ± 0.55)	0.05 (S.)
	Range	(2.0 – 4.20)	(2.15 - 4.5)	
Bl. Loss	Mean ± SD	(1.3 ± 0.79)	(1.4 ± 1.07)	0.635 (N.S.)
	Range	(200 – 3000)	(300 – 4000)	
Hospital stay (day)	Mean ± SD	(7 ± 1.5)	(8 ± 1.5)	(0.74) (N.S.)
	Range	(6 – 14)	(7 – 15)	
Duration of drain.	Mean ± SD	(6.5 ± 1)	(7 ± 1.5)	(0.78) (N.S.)
	Range	(5 – 10)	(6 – 11)	

****** student T. test.***

- There is no statistically significant difference between the two groups as regards the Blood Loss with the P. value of (0.635). In the

lymphadenectomy group, most of the patients required 2 unites of blood with the range from (0- 6) unites of blood.

- There is significant statistical difference between the two groups as regards the operative time with the P. value 0.05.
- There is no statistically significant difference between the two groups as regards the postoperative hospital stay or the duration of drainage with the P. value (0.74) and (0.78) respectively.

Table (10): Relation between early postoperative complication rate between the conventional and the lymphadenectomy groups.

Complications	Conventional (30)		Lymphadec. (30)		P value
	No	%	No	%	
Absent	22	73.3%	20	70.0%	0.774 (N.S.)**
Present	8	26.7%	10	30.0%	

***** Chi- Square Likelihood Ratio test.***

There is no statistical difference between the two groups as regards the incidence of early postoperative complications.

Table (11): Relation between the two groups as regards the operative and early postoperative complications:

Complications	Conventional (30)		Lymphaden.(30)		*P value* **
	No. (8)	%	No. (10)	%	
Wound infection	3	37.5%	4	44.4%	0.550 (N.S.)
Prolapsed colostomy	1	12.5%	1	11.1%	0.557 (N.S.)
Intestinal obstruct.	2	25.0%	1	11.1%	0.673 (N.S.)
Urethral injury	0	0.0%	1	11.1%	0.640 (N.S.)
Chest infection	2	25.0%	3	22.2%	0.647 (N.S.)

**** Chi- Square Likelihood Ratio test.***

There is no significant statistical difference between the two groups as regards the operative or early postoperative complications.

Table (12):The incidence of lymphadenectomy related complications:-

Type of complication	Incidence (pts.)	percent
Lymphocyst	1	3.3 %
Deep venous thrombosis	2	6.7 %
Leg oedema	0	0.0%

Incidence and pattern of lymph node metastasis in the lymphadenectomy group:

Table (13): Incidence of positive nodes.

Total No. of patients	Negative L.N		Positive L.N	
	No.	%	No.	%
(30)	14	46.7%	16	53.3%

The incidence of positive (+ve) lymph nodes was 16 out of 30 pts (53.3%).

Table (14): Pattern of lymph node spread in the positive group:

Total	**No. (16)**	**Percent (100%)**
Axial	6	37.5%
Lateral	3	18.75%
Axial + lateral	7	43.75%

- The incidence of total +ve nodes was (53.3%).
- The incidence of +ve axial nodes was (37.5%).
- The incidence of +ve lateral nodes was (18.75%).
- The incidence of +ve Axial + lateral nodes was (43.75%).
- The incidence of +ve total lateral nodes was (62.5%).
- The incidence of +ve total axial nodes was (81.25%).

❖ ***N.B. *axial (superior rectal, inferior mesenteric).***

****Lateral spread (middle rectal, obturator, internal iliac).***

**** Total lateral.....lateral+(axial+lateral).***

**** Total axial.....axial + (axial + lateral).***

Table (15) : Relation between the site of the tumour versus the nodes status in the axial, lateral and axial+lateral groups.

Site	Axial		Lateral		Axial + Lateral		Total positive	
	No.	%	No.	%	No	%	No.	%
	(6)	(20%)	(3)	(10%)	(7)	(23.3%)	(16)	(53.3%)
Upper	2	33.3%	-	0.0%	-	0.0%	2	12.5%
Mid	1	16.7%	-	0.0%	3	42.7%	4	25.0%
Lower	3	50%	3	100.0%	4	57.1%	10	62.5%

Table (16): Relation between pelvic lymph nodes status and the site of the tumour.

Site	Total (30)	Negative (20)		Positive (10)	
		No.	%	No.	%
Upper	3	3	15%	-	0.0%
Mid	10	7	35%	3	30%
Lower	17	10	50%	7	70%

- The incidence of +ve pelvic lymph nodes in 10 (33.3%) out of 30 pts.
- The incidence of +ve pelvic lymph nodes was zero (0.0%) for upper rectum.
- The incidence of +ve pelvic lymph nodes was in 3 (30%) out of 10 pts. in mid rectum.
- The incidence of +ve pelvic lymph nodes was in7 (41%) out of 17 pts. in low rectum and 70% of the total +ve pelvic nodes.

Table (17) the incidence of +ve lymph nodes in mid and low cancer rectum:-

Site	Total (30)	Total positive(16)		+ve pelvic (10)	
		No.	%	No.	%
Mid	10	4	40%	3	30%
Low	17	10	58.5%	7	41.1%

- ❖ 10 out of 17 patients with low cancer rectum showed +ve nodal metastasis (58.8%).
- ❖ 7 out of these 17patients showed pelvic nodal metastasis (41.1%).

So the incidence of +ve lymph nodes in low rectum is 58.8% and the incidence of pelvic nodal affection is 41.1%.

- ❖ 4 out of 10 patients with mid cancer rectum showed +ve nodal metastasis (40%).
- ❖ 3 out of these 10 patients had pelvic nodal metastasis (30%).

So the incidence of +ve lymph nodes in mid rectum is 40%% and the incidence of pelvic nodal affection is 30%.

Table (18): Relation between the incidence of +ve nodes and staging:

Staging	**Total (30)**	**Lymph Node involvement**				**P. value**
		Negative (14)		**Positive (16)**		
		No.	**%**	**No.**	**%**	
Dukes' A	2	2	14.3%	0	0.0%	
Dukes' B_1	9	7	50.0%	2	12.5%	
Dukes' B_2	4	1	7.1%	3	18.8%	0.006
Dukes' C	15	4	28.6%	11	68.8%	(S.)**

***** Chi- Square Likelihood Ratio test.***

The incidence of positive lymph nodes and the Dukes' staging is highly significant for those with Dukes' B_2 and C staging with the P. value (0.006).

Table (19): Relation between the incidence of positive pelvic lymph node involvement and the Dukes' staging.

Dukes'	Total (30)	Negative (20)		Positive (10)		P. value
		No.	%	No.	%	
A	2	2	10 %	-	0.0%	0.004 (S.)**
B_1	9	7	35%	2	20%	
B_2	4	3	15%	1	10%	
C	15	8	40%	7	70%	

** ***Chi- Square Likelihood Ratio test.***

About 70% of the positive pelvic lymph node cases were Dukes' C which is statistically significant with P. value 0.004.

Table (20): The number of lymph nodes detected in different groups:-

Lymph node group	Median (No.)	Range
Aortic	8	3-14
Common iliac	4	4-6
External iliac	5	3-7
Obturator	2	1-3
Internal iliac	3	2-4
Total pelvic	17	6-30

Table (21): The number of lymph nodes detected in different groups:-

	Total number of positive nodes (16)	No. of positive nodes detected		
		1-3	4-9	>10
Pelvic	3	1	2	-
Aortic	6	3	3	-
Pelvic & Aortic	7	0	4	3

Table (22): the pattern of pelvic and aortic lymph node involvement in the lymphadenectomy (30) patients:

Group of L.N.	**Negative**		**Positive**	
	No.	**%**	**No.**	**%**
Common iliac nodes	28	93.3%	2	6.7%
External iliac nodes	29	96.7%	1	3.3%
Internal iliac nodes	15	50.0%	15	50.0%
Obturator nodes	22	73.3%	8	26.7%
Aortic lymph nodes	19	63.3%	11	36.7%

Table (23): the incidence of +ve nodes in relation to age and sex

		Negative (14)		Positive (16)		P. value
		No.	%	No.	%	
Sex	Male	8	57.1%	11	68.8%	0.5 (N.S.)**
	Female	6	42.9%	5	31.2%	
Age	<50 y.	4	56.6%	9	60%	0.04 (S.)**
	>50 y.	10	43.4%	7	40%	

*** Chi- Square Likelihood Ratio test.*

- There is no statistical difference between the incidence of +ve lymph nodes and the sex of the patients with the P. value (0.5).
- There is statistical difference between the incidence of +ve lymph nodes and the age of the patients with the P. value (0.05).

Lymph Node involvement in relation to other clinico-pathological data:-

Table (24): Lymph Node involvement in relation to gross pathology.

		Lymph Node involvement				
		Negative (14)		Positive (16)		P. value
		No.	%	No.	%	
Site	Upper	1	7.1%	2	12.5%	0.05 (S.)**
	mid	6	42.9%	4	25.0%	
	Lower	7	50.0%	10	62.5 %	
Size	< 5 Cm	8	57.1%	3	18.8%	0.002 (S.)**
	> 5 Cm	6	42.9%	13	81.2%	
Morphology	Exophytic	10	71.4%	8	50.0%	0.05 (S.) **
	Non-exophytic	4	28.6%	8	50.0%	

*** Chi- Square Likelihood Ratio test.*

- There is marginally statistical difference between the incidence of +ve lymph nodes and the site of the tumour with the P. value (0.05).
- There is highly significant difference between between the incidence of +ve lymph nodes and the size of the tumour with the P. value (0.002).
- There is marginally statistical difference between the incidence of +ve lymph nodes and the morphology of the tumour with the P. value (0.05).

Table (25): lymph node involvement in relation to microscopic picture.

		Lymph Node involvement				
		Negative (14)		Positive (16)		P. value
		No.	%	No.	%	
Type	Adenocarcin.	14	100%	7	43.8%	0.001
	Mucoid	0	0.0%	9	56.2%	(S.)*
Grade	II	13	92.9%	8	50%	0.007
	III	1	7.1%	8	50%	(S.)**
	Lymphatic A.	10	71.4%	4	25%	0.026
	Invasion P.	4	28.7%	12	75%	(S.)*
	Vascular A.	12	85.7%	7	43.8%	0.05
	invasion P.	2	14.3%	9	56.2%	(S.)*
	Perineural A.	10	76.9%	13	81.3%	0.014
	invasion P	4	23.1%	3	18.7%	(S.)**
	Submucous A	14	100%	14	87.5%	0.485
	extension P.	0	0.0%	2	12.5%	(N.S.)*
	Synchronus A	13	92.9%	15	93.8%	0.92
	polyps P.	1	7.1%	1	6.2%	(N.S.)**

** fisher exact test. ** Chi- Square Likelihood Ratio test.*
(A; absent & P; present)

- There is highly significant difference between the incidence of +ve lymph nodes and the type of the tumour with the P. value (0.001).
- There is highly significant difference between the incidence of +ve lymph nodes and the grade of the tumour with the P. value (0.007).

- There is statistically significant difference between the incidence of +ve lymph nodes and the lymphatic invasion of the tumour with the P. value (0.026).
- There is statistically significant difference between the incidence of +ve lymph nodes and the vasular invasion of the tumour with the P. value (0.05).

- There is statistically significant difference between the incidence of +ve lymph nodes and the perineural invasion of the tumour with the P. value (0.014).

- There is no statistical difference between the incidence of +ve lymph nodes and submucous extension and synchronous polyps of the tumour with the P.values (0.485) and (0.92) respectively.

Table (26): Incidence of recurrence in the lymphadenectomy group :-

Type of recurrence	Number	percent
Local recurrence (LR)	3	10%
Distant metastasis	3	10%
LR + Distant metast.	1	3.3%

Table (27): Relation between the conventional group and the lymphadenectomy group as regards the incidence of local recurrence.

Local recurrence	**Conventional (30)**		**Lymphaden.(30)**		**P. value**
	No	**%**	**No**	**%**	
Absent	19	63.3%	26	86.7%	0.034 (S.)****
Present	11	36.7%	4	13.3%	

**** *Chi- Square test.*

The over all recurrence rate in the lymphadenectomy versus the conventional group was (13.3%) versus (36.7%) with the p. value (0.034) which is statistically significant.

Table (28): Relation between the time of recurrence between the conventional and the lymphadenectomy groups.

Time of Recurr.	Conventional	Pelvic lymph	P value
Mean ± stand --	(9.00 ± 3.45)	(11.45± 2.84)	0.184
Range	(6.00 - 12.00)	(8.00 - 18.00)	(N.S.)**

***** Chi- Square Likelihood Ratio test.***

Lymphadenectomy delays slightly the onset of local recurrence although it didn't reach a statistical significance as it is also affected by other parameters and the limited time of follow up.

Table (29): Relation between the site of recurrence between the conventional and the lymphadenectomy groups.

Site of Recurrence	Conventional		Lymphadec.		*P.value*
	No.	%	No.	%	****
Post vaginal wall	1	9.1%	1	25.0%	0.871 (N.S.)
Suture line	1	9.1%	1	25.0%	0.540 (N.S.)
Colonic	3	27.3%	1	25.0%	0.673 (N.S.)
Perineal scar	1	9.1	1	25.0%	0.981 (N.S.)
Regional lymph nodes	5	45.5%	0	0.0%	0.002 (S.)

******* Chi- Square test.***

This table shows the difference in the pattern of local recurrence with No recurrence related to the lymph nodes in patients who underwent lymphadenectomy compared to the conventional group which is nearly half (45.5%) recurrences in this group which is statistically highly significant with the P. value 0.002%.

Table (30): Relation between Dukes' staging and the local recurrence

Dukes'	Total No. (30)	Negative (14) absent		Positive (16) present		P. value
A	2	2	7.7 %	-		
B_1	9	9	43.6%	-		0.047 (S.)****
B_2	4	4	15.4%	-		
C	15	11	42.3%	4	100%	

****Chi- Square test.*

All recurrences were Dukes' C (4 cases, 100%).

Table (31): Relation between the local recurrence and the lymph node status.

Local recurrence		Negative (14)		Positive (16)		P. value
		No.	%	No.	%	
	absent	14	100%	12	75.0%	0.048
	Present	0	0.0%	4	25.0%	(S.)****

****Chi- Square test*

- *There is no recurrence related to those patients with negative (-ve) nodal affection.*
- *All recurrences were Dukes' C patients with +ve lymph nodal affection.*

Table(32): Recurrence- Free Survival % in relation to clinico-pathological parameters.

Parameter	*30-month recurrence Free Survival %*	*P. value*
Pelvic lymphadenectomy		
Yes	77.1 %	0.039
No	63.3 %	(S)****
Site of tumour		
Mid-rectum	67.58 %	0.5
Low-rectum	67.28 %	(NS)****
Size <5cm	52.17 %	0.006
>5cm	95.0 %	(S)****
Morphology		
Non-exophytic	53.48 %	0.069
Exophytic	81.99 %	(?S)****
Histopathological type		
Adenocarcinoma	75.0 %	0.08
Mucoid	60.0 %	(?S)****
Tumour grade		
Grade II	73.68 %	0.114
Grade III	58.62 %	(NS)****
Lymphatic invasion		
Absent	75 %	0.225
Present	63.3%	(NS)****
Pelvic lymph node involvement		
positive	59.66 %	0.05
negative	100 %	(S)****
Vascular invasion		
Absent	70.0 %	0.569
present	66.0 %	(NS)****
Dukes' stage		
A & B1	17 %	0.07
B2& C	5 %	(?S)****

**** *Chi- Square test.*

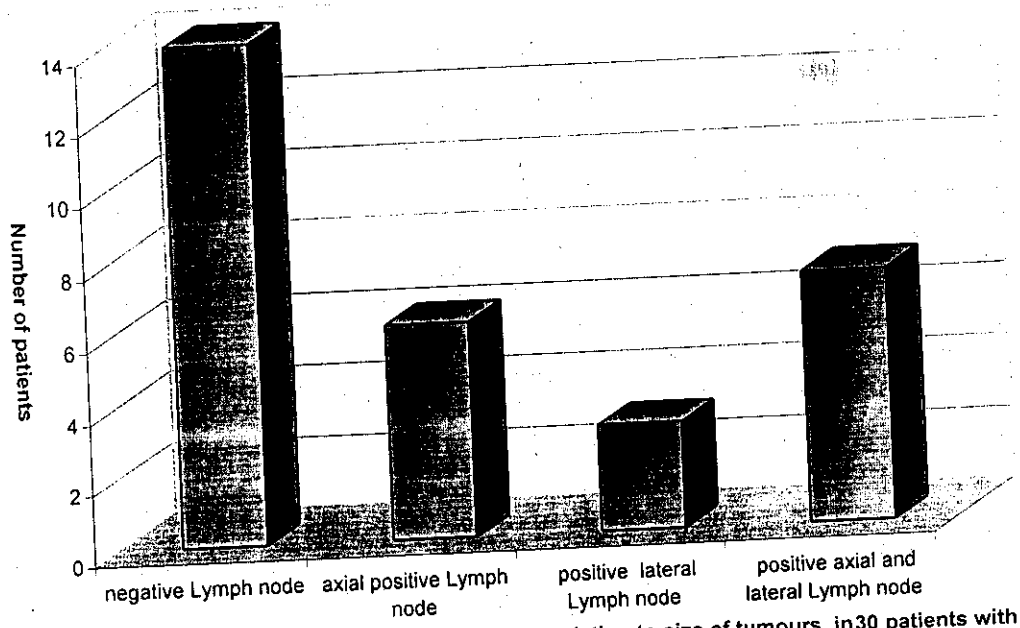
Kaplan- Meyer Survival method:

S: Significant.

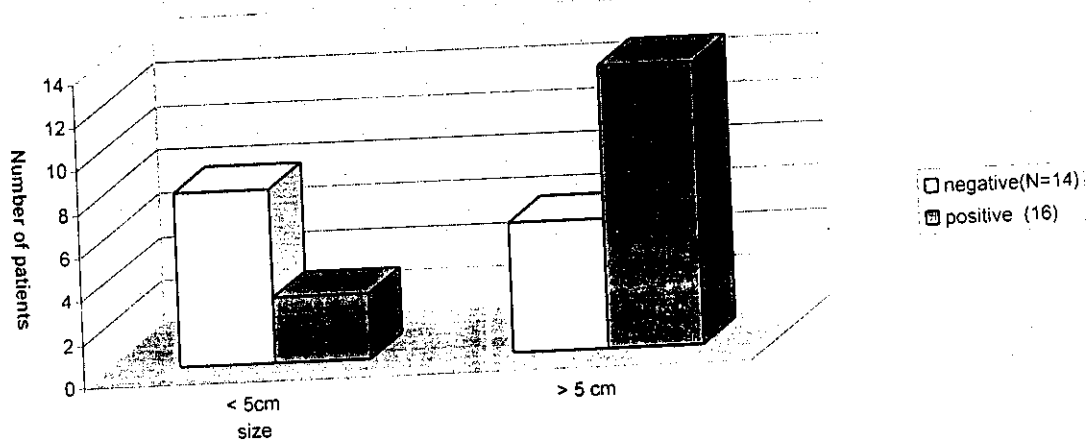
? S: Marginally significant.

NS: Non Significant

Figure (15) :Lymph node involvement and Pattern of lymph spread in 30 patients with rectal carcinoma



Fig(17) : Lymph node involvement in relation to size of tumours in30 patients with rectal carcinoma



Fig(16) : Lymph node group involvement 30 patients with rectal carcinoma

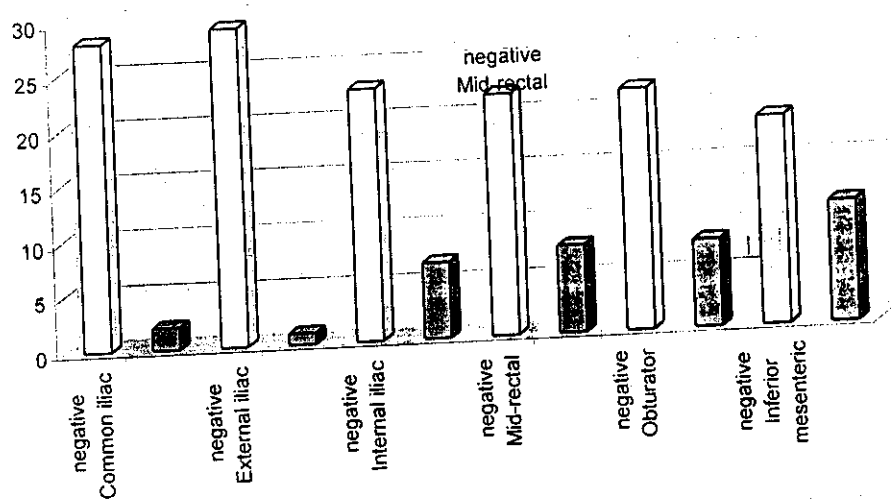
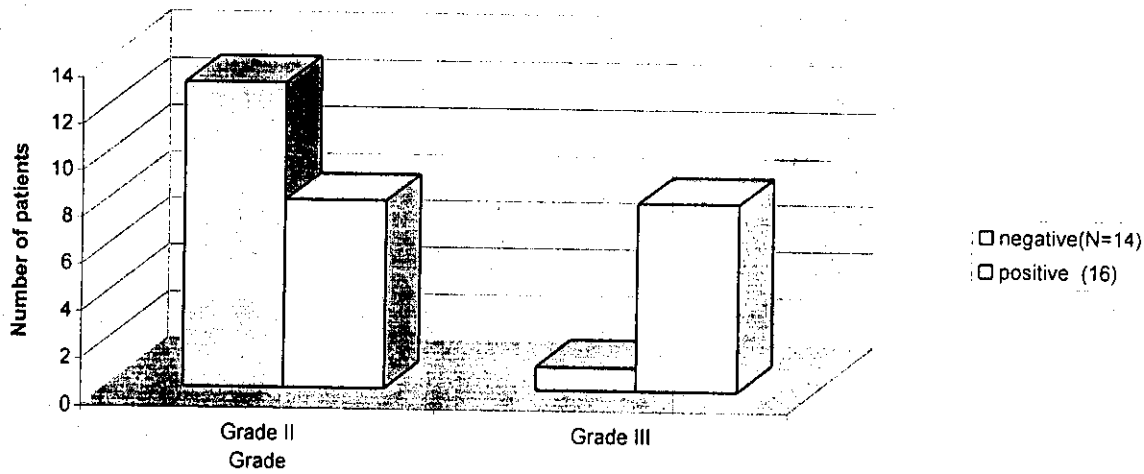
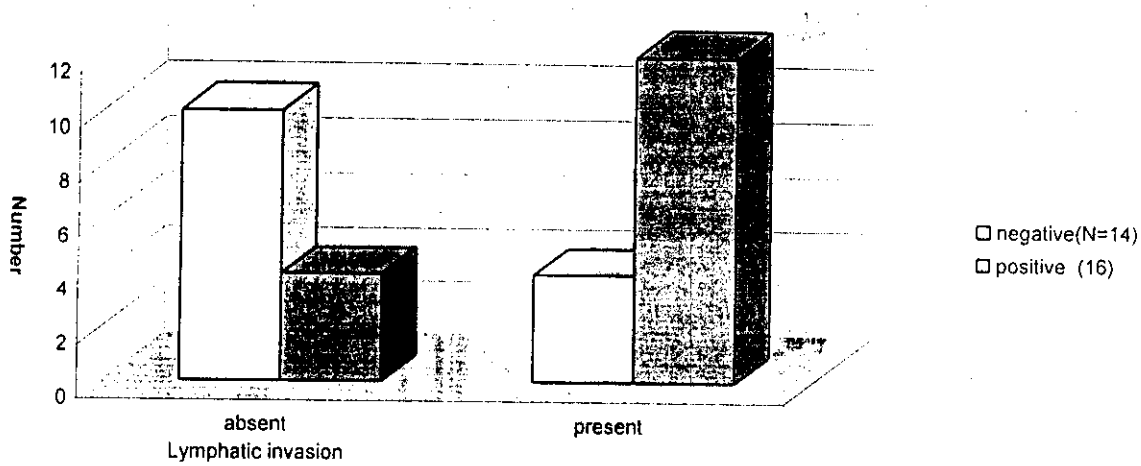


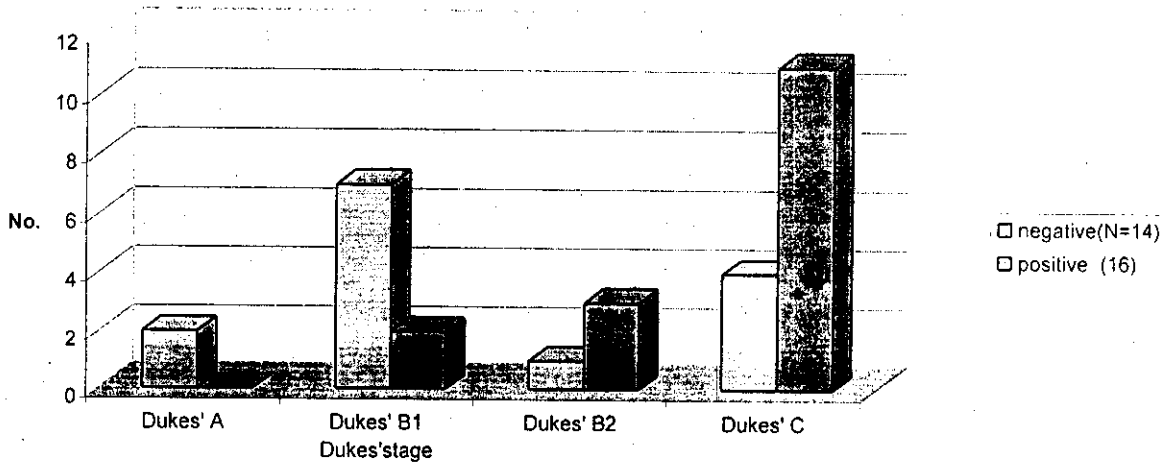
Fig.(18) : Lymph node involvement in relation to grade of tumors in 30 patients with rectal carcinoma



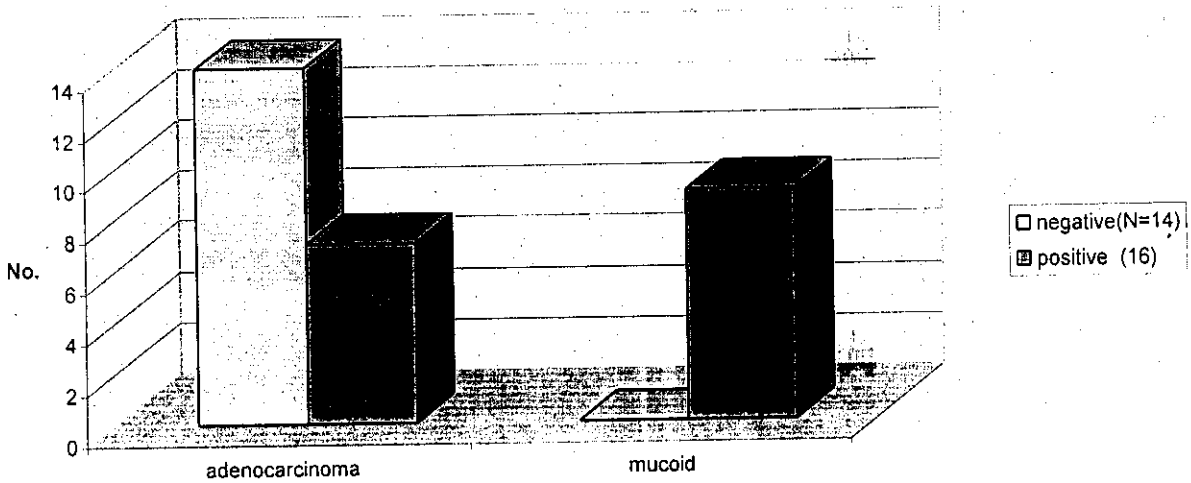
Fig(19) : Lymph node involvement in relation to lymphatic invasion in 30 patients with rectal carcinoma



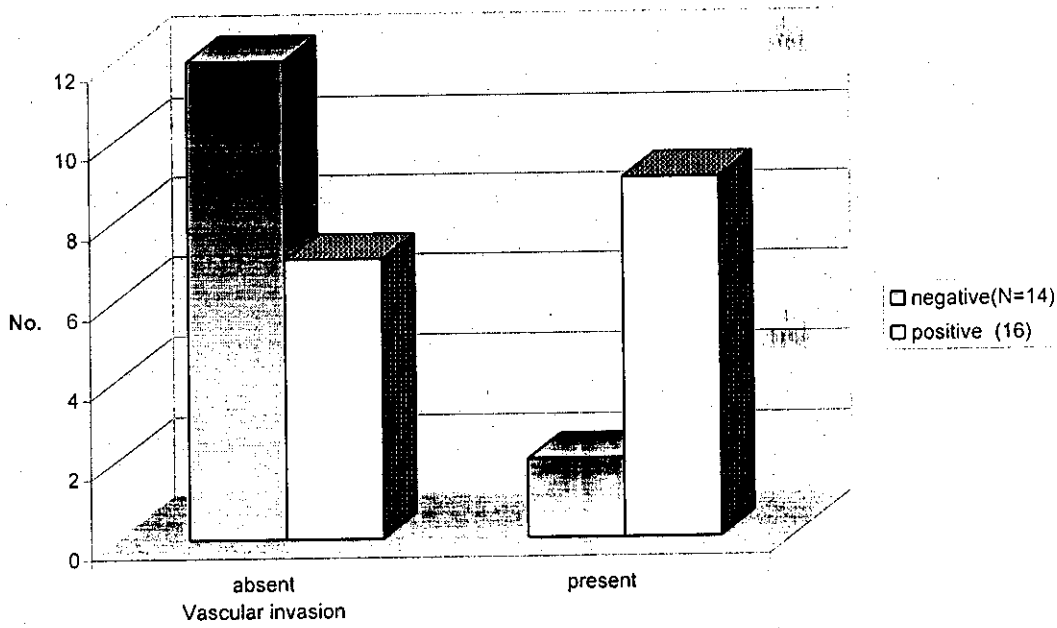
Fig(20) : Lymph node involvement in relation to Dukes'stage of tumors in 30 patients with rectal carcinoma



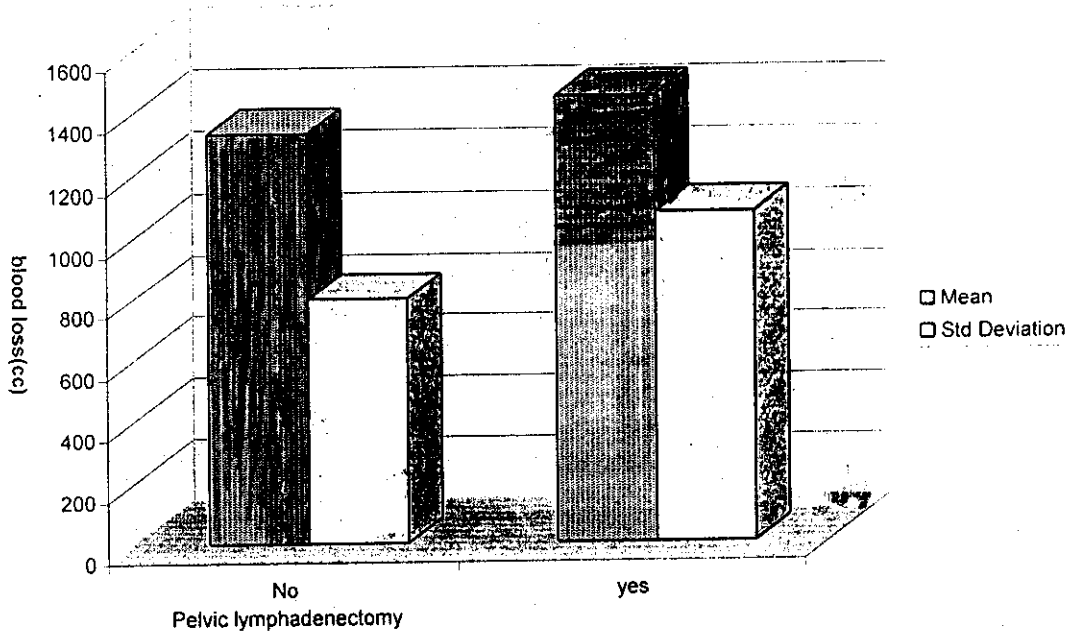
Fig(21) : Lymph node involvement in relation to histologic type of tumor in 30 patients with rectal carcinoma



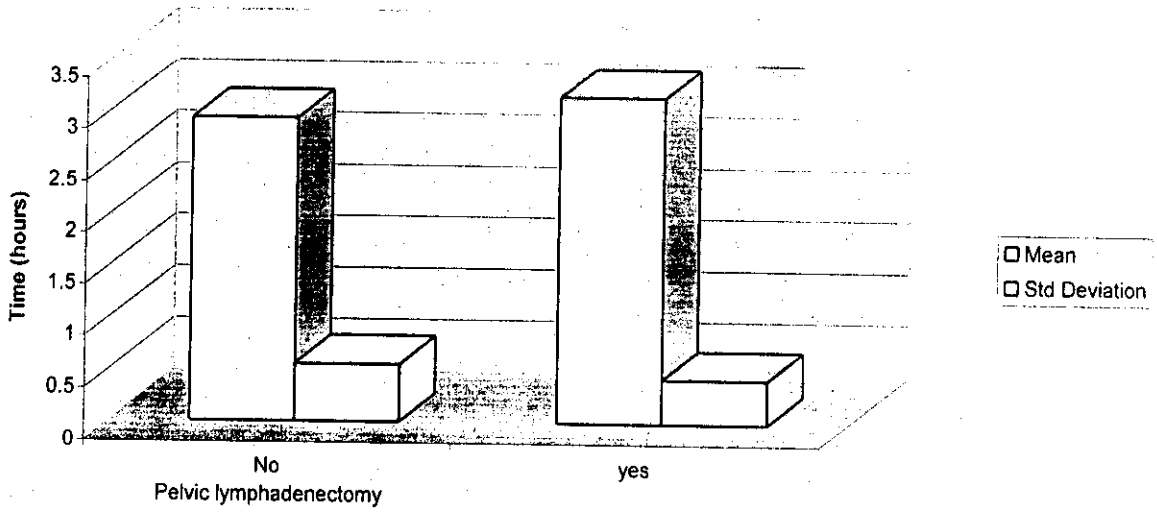
Fig(22) : Lymph node involvement in relation to vascular invasion in 30 patients with rectal carcinoma



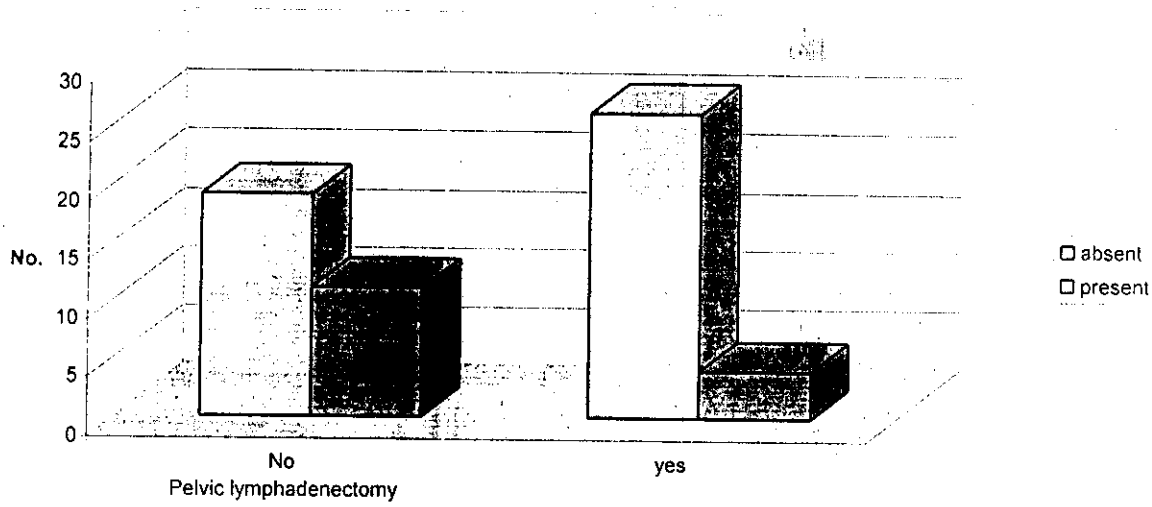
Fig(23) : blood loss in operations with or without pelvic lymphadenectomy.



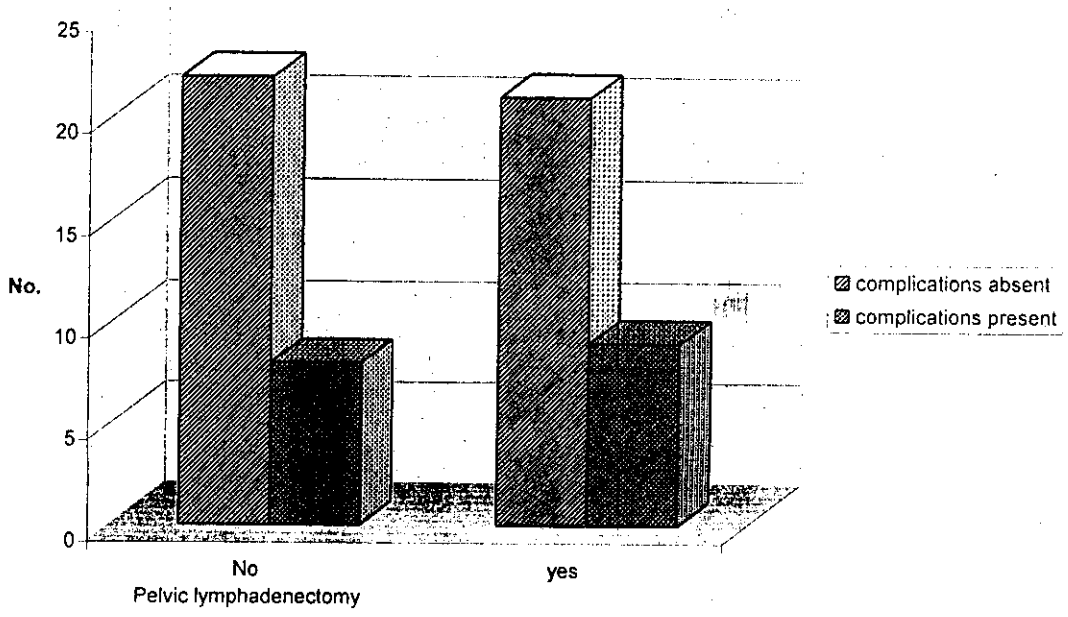
Fig(24) : Operative time with or without pelvic lymphadenectomy.



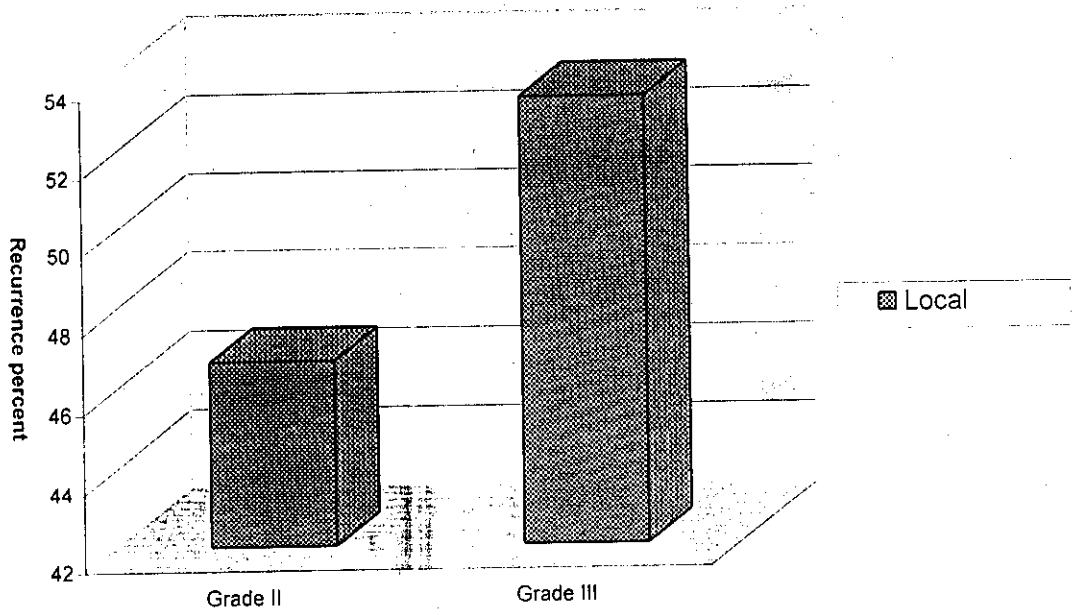
Fig(25) : Local recurrence as a function of type of operation



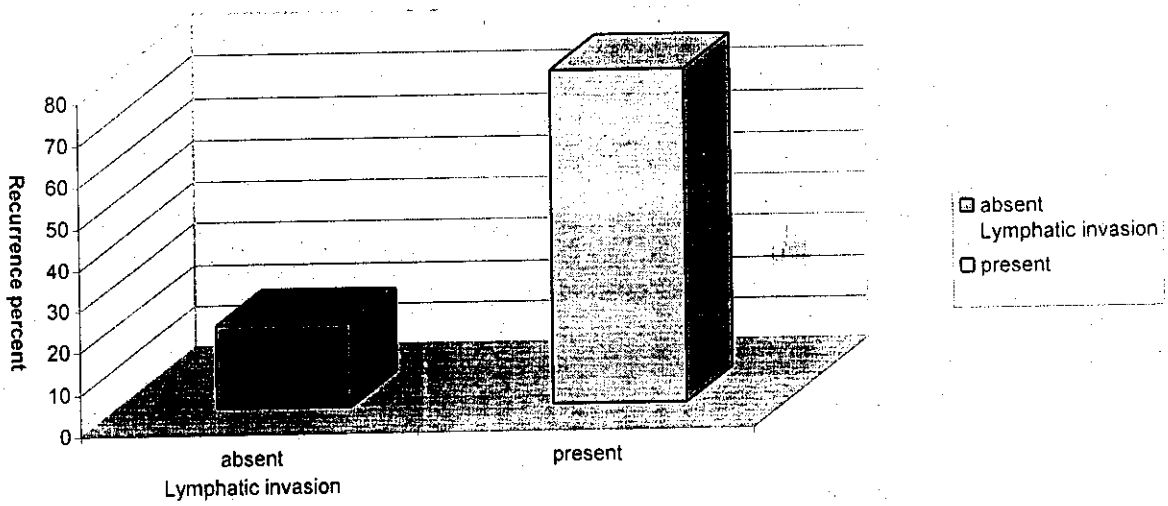
Fig(26) : complications in relation to lymphadenectomy



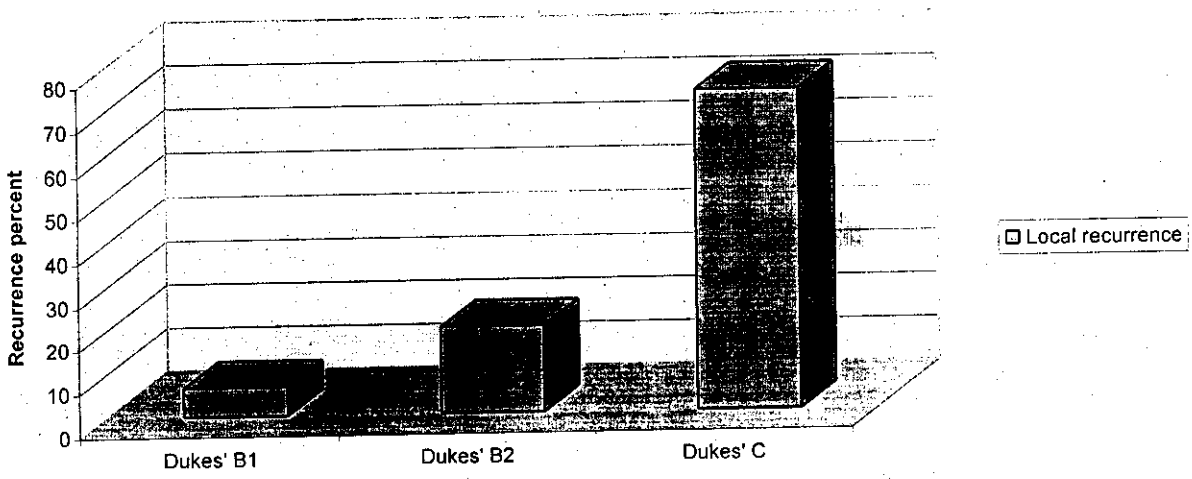
Fig(27) : Local recurrence in relatuion to grade of tumors in 30 patients with rectal carcinomas.

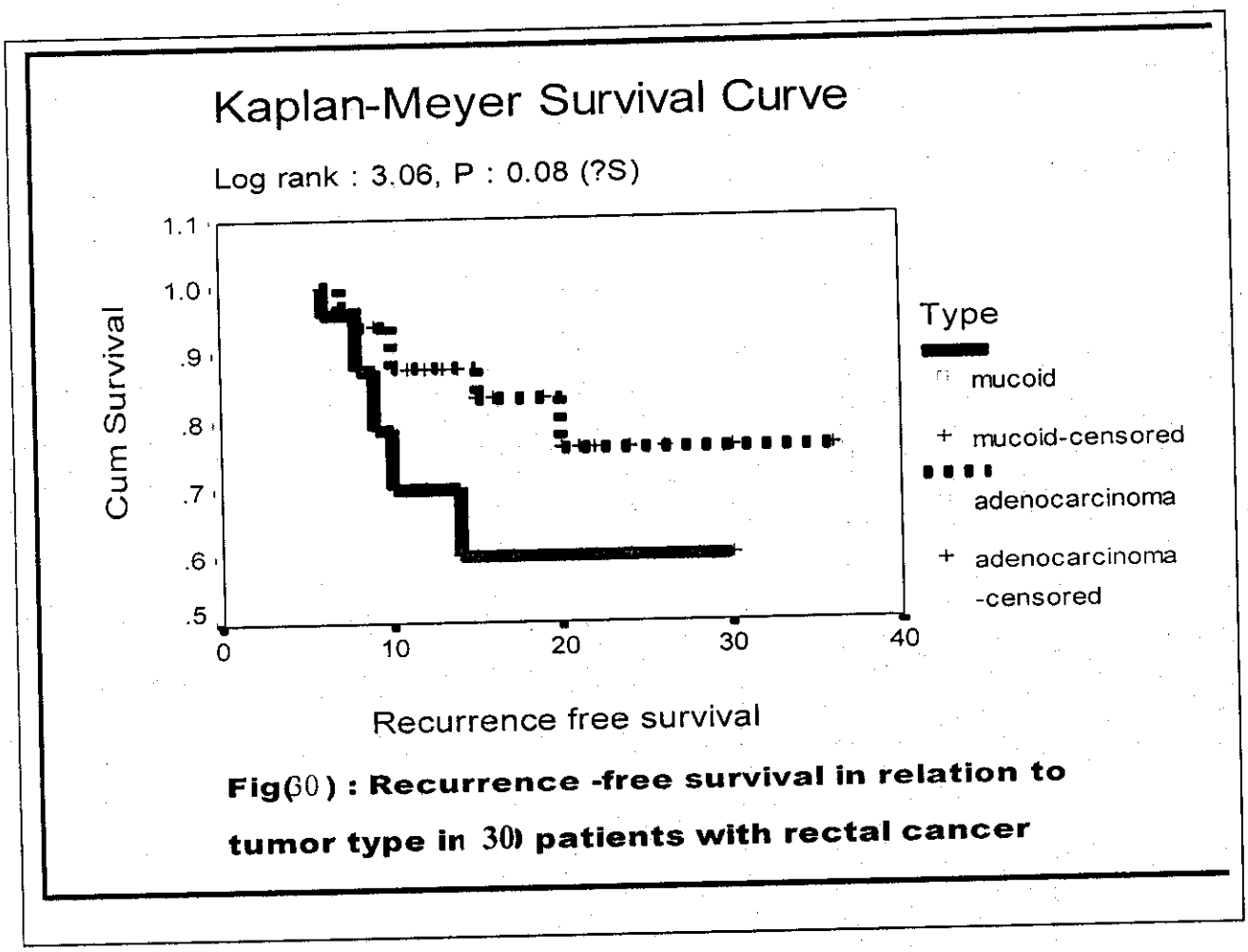


Fig(28) : Local recurrence in relation to lymphatic invasion of the tumour.

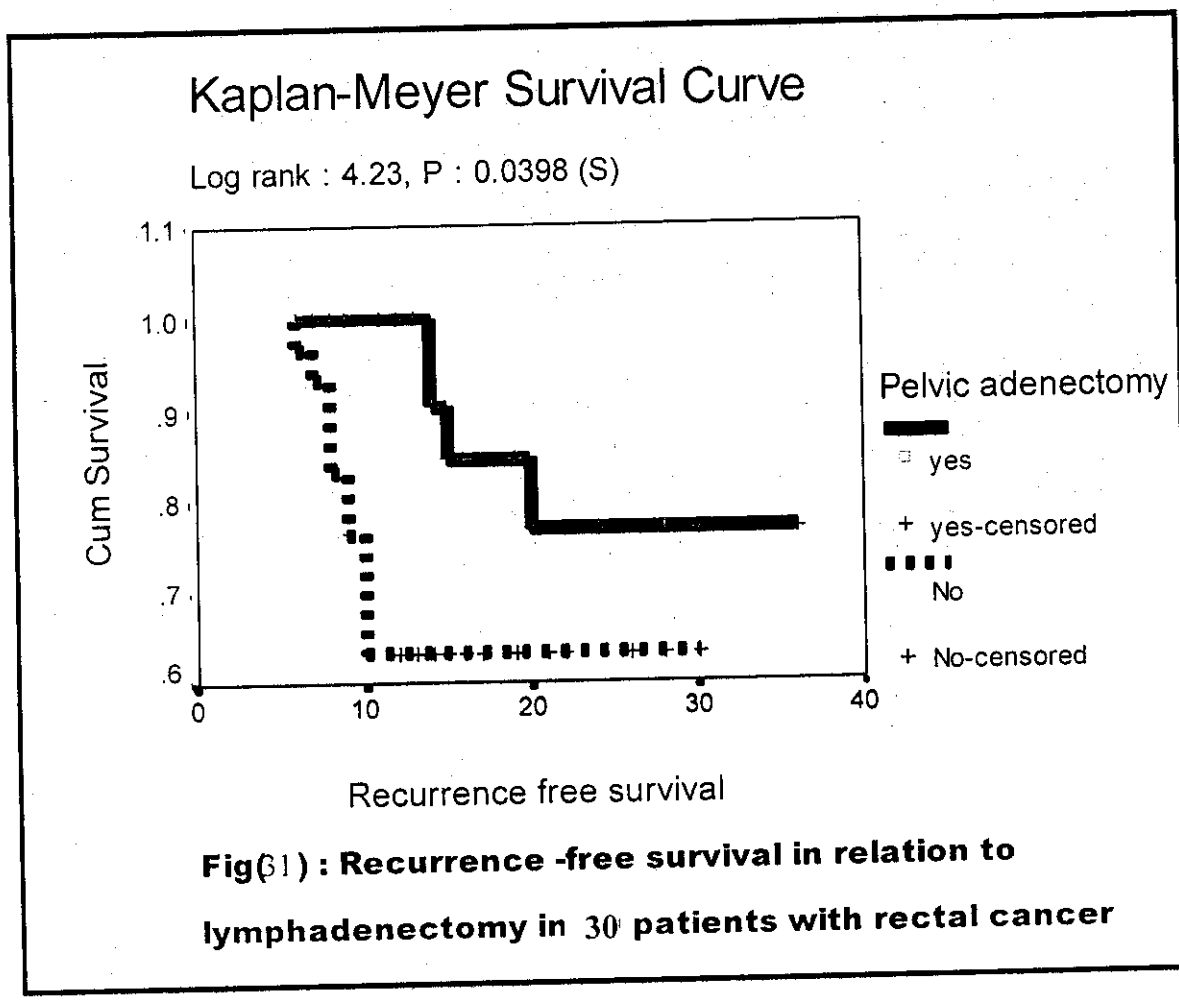


Fig(29) : Local recurrence in relation to Dukes' staging of tumors in 30 patients with rectal tumors.

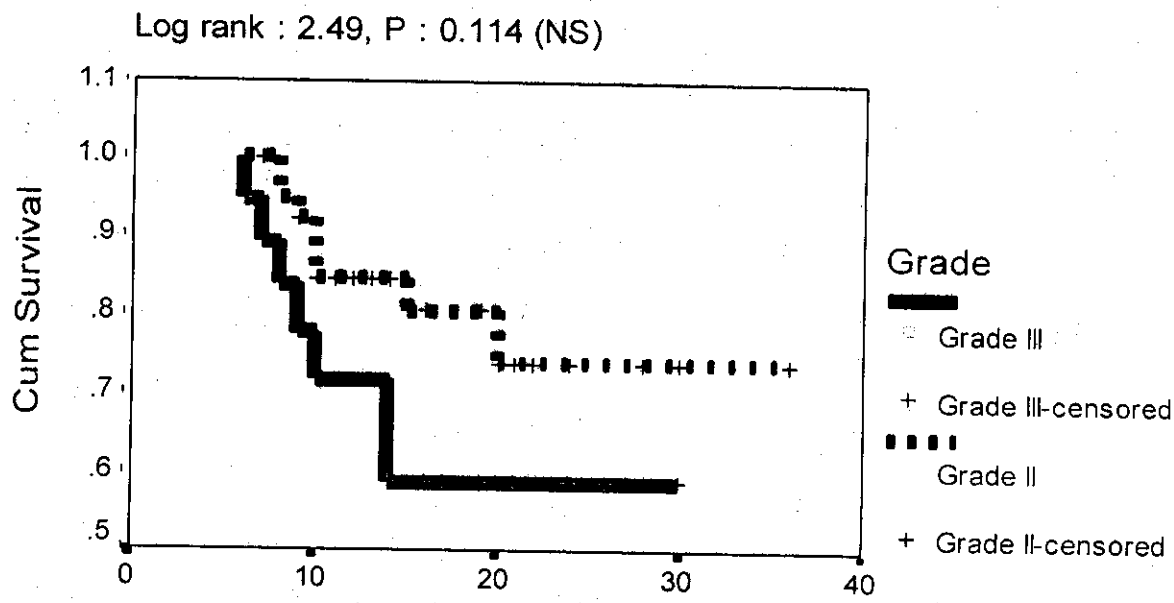




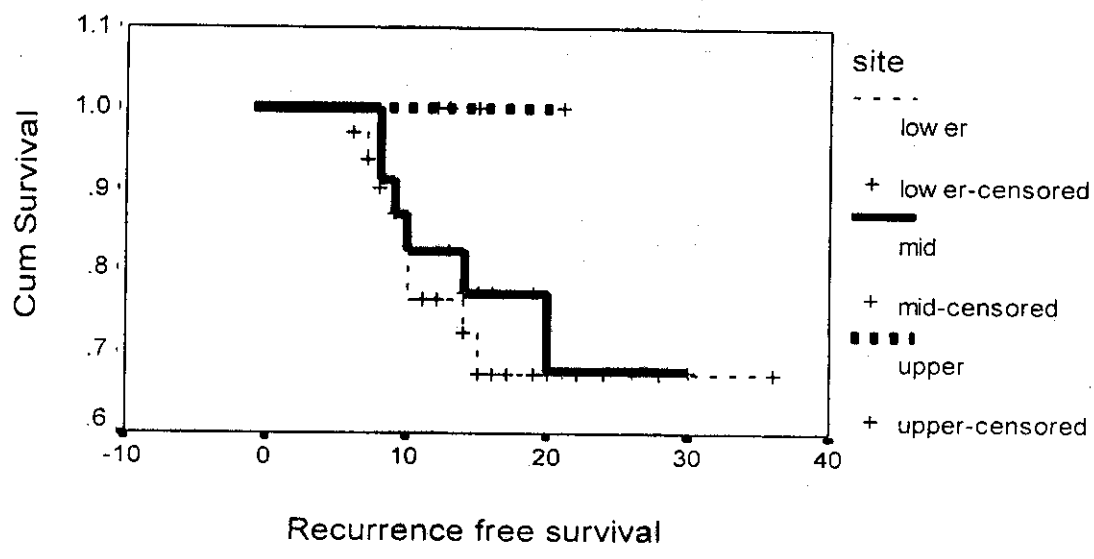
Fig(30) : Recurrence -free survival in relation to tumor type in 30 patients with rectal cancer



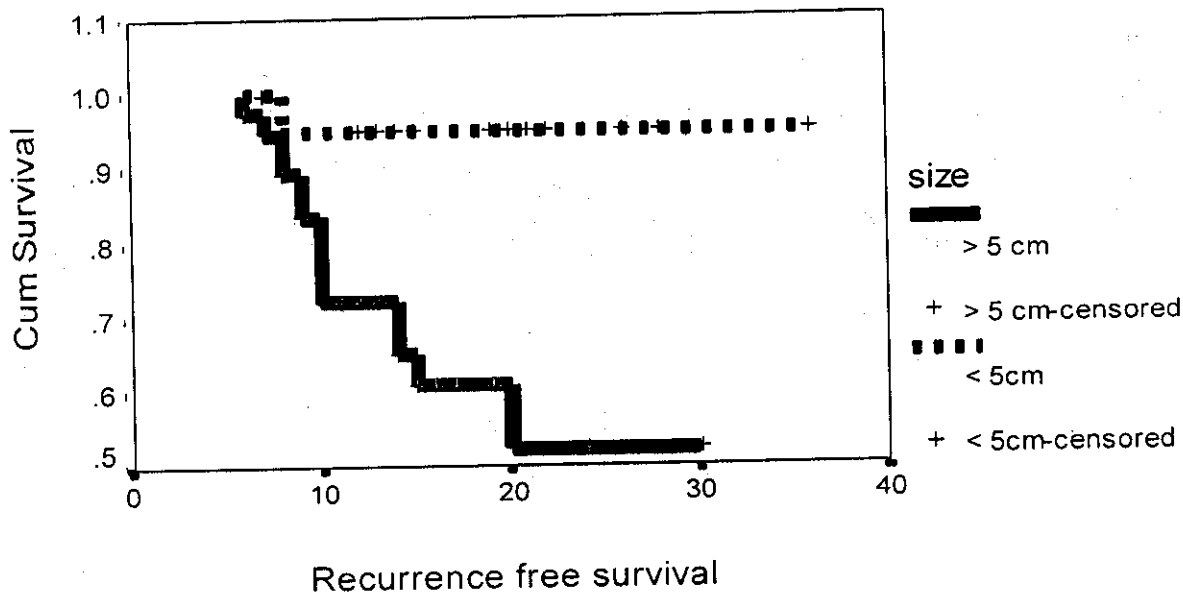
Fig(31) : Recurrence -free survival in relation to lymphadenectomy in 30 patients with rectal cancer



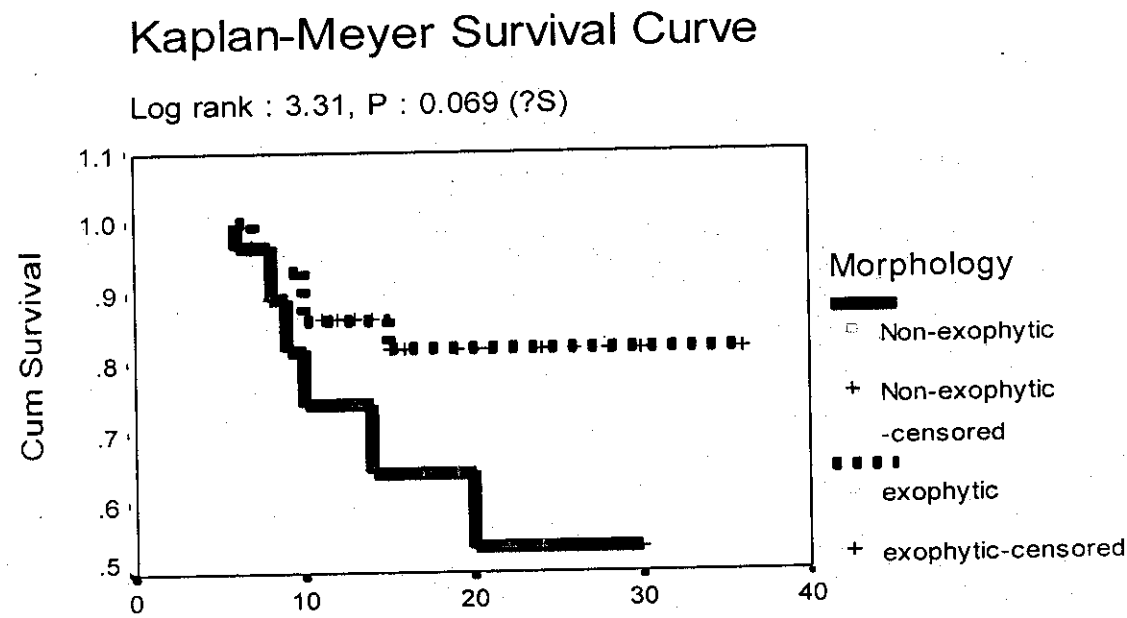
Fig(32) : Recurrence -free survival in relation to tumour grades in 30 patients with rectal cancer



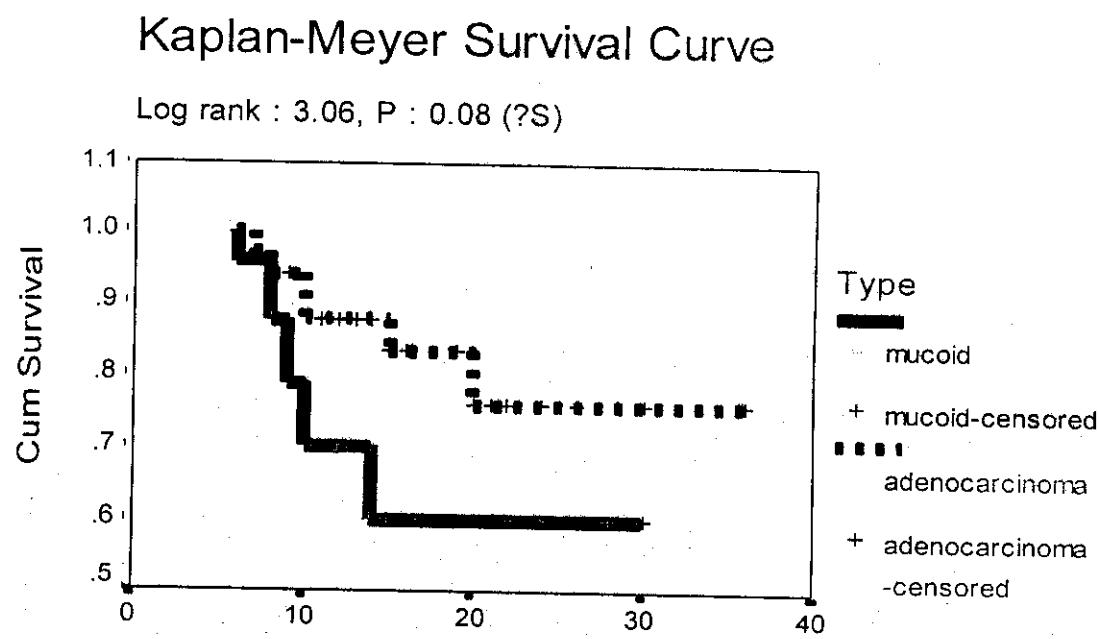
Fig(33) : Recurrence -free survival in relation to site of Tumour in 30 patients with rectal cancer



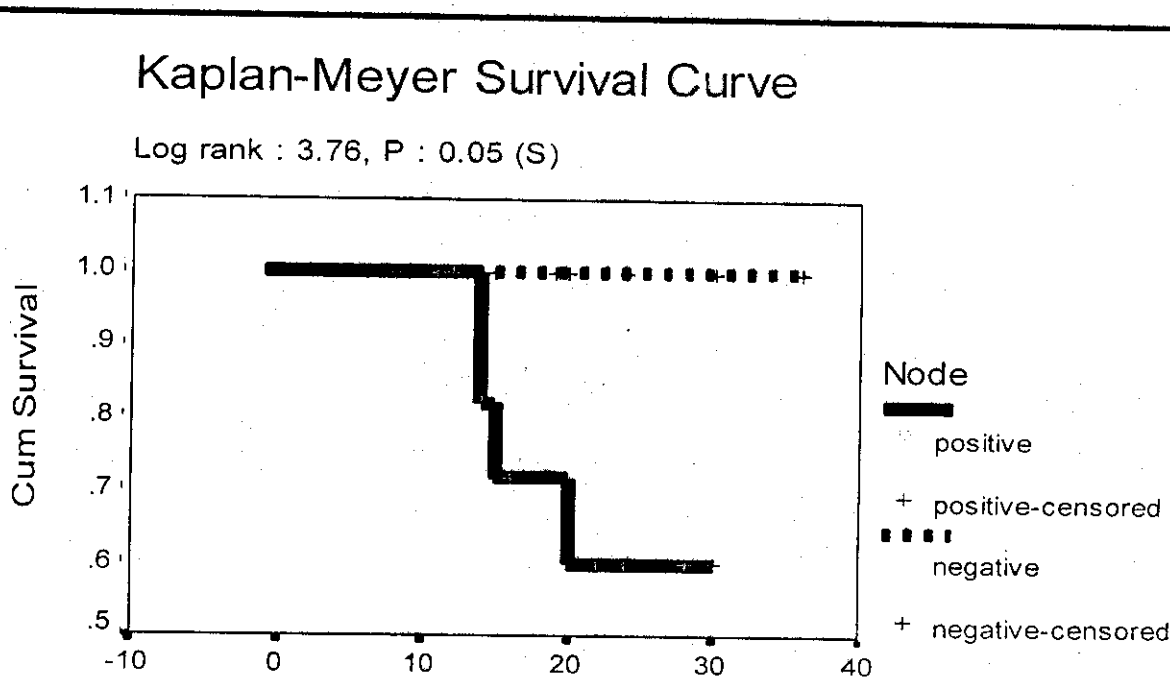
Fig(34) : Recurrence -free survival in relation to size of Tumour in 30 patients with rectal cancer



Fig(35) : Recurrence -free survival in relation to morphology of tumors in 30 patients with rectal cancer



Fig(36) : Recurrence -free survival in relation to tumour type in 30 patients with rectal cancer



Fig(37) : Recurrence -free survival in relation to lymph node involvement in 30 patients with rectal cancer