Results

RESULTS

The results gained from this work have been analysed and collectively tabulated in serial tables as follows:

First of all, the included patients were classified into two groups:

I- Group A : Include 30 patients. All of them had Nissen fundoplication by conventional surgical method.

Group B :

Includes 30 patients, all of them were operated upon by laparoscopic Nissen fundoplication.

Two patients were converted to the open procedure due to injury of the spleen and the short gastric vessels and were added to group (A).

The clinical data gained from the included patients were summerized as follows:

Table (2) Fig 18 (a-c) : Shows the age and sex of the patients.

Table (3) Fig 19 : Shows the presenting symptoms.

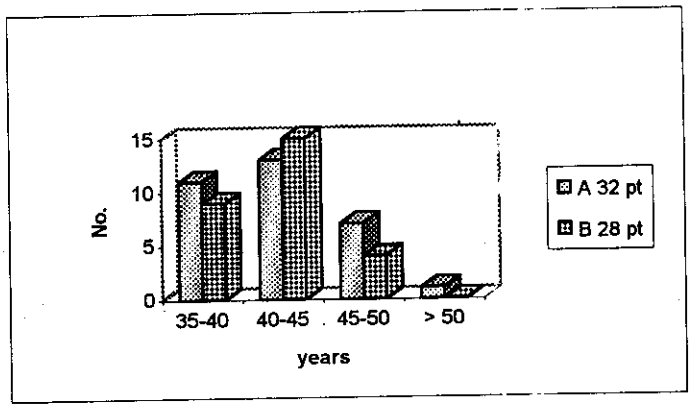
Table (4) Fig 20 : Shows the duration of symptoms of each group.

Table (5) Fig (21): Shows relation of patients' symptoms to meal and posture .

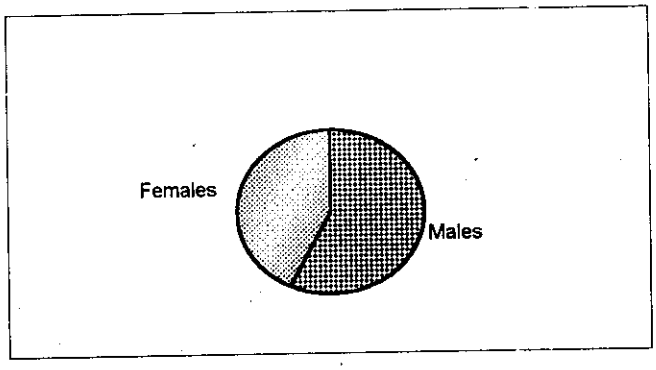
Table (2): The age and sex of the patients of each group.

	Group A 32 pt		Group B 23 pt		Total 60 pt	
	No.	*%*	*No.*	*%*	*No.*	*%*
I Age						
35-40 years	11	34.375	9	32.143	20	33.333
40-45 years	13	40.625	15	53.571	28	46.667
45-50 years	7	21.875	4	14.286	11	18.333
> 50 years	1	3.125	-		1	1.667
Total	32		28		60	
II sex						
Males	19	59.375	16	57.143	35	58.333
Females	13	40.625	12	42.857	25	41.667
Total	32		28		60	

Fig (18) : Comparison between number of patients of each group acording to their age (a,b,c).



Sex of the patients of group (A).



Sex of the patients of group (B)

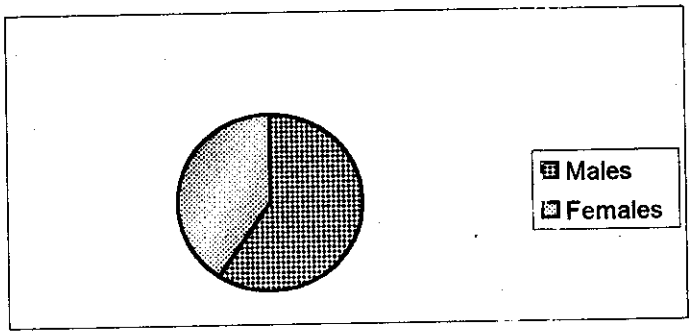


Table (3): The main presenting symptom and other symptoms of each group.

	Group A (32 pt)		Group B (28 pt)		Total	
	No.	%	No.	%	No.	%
Heart burn	27	84.375	24	85.714	51	85
Regurgitation	11	34.375	10	35.714	21	35
Dysphagia	9	28.125	8	28.571	17	28.333
Epigastric pain	10	31.25	9	32.142	19	31.667
Belching	3	9.375	3	10.714	6	10
Nausea	6	18.75	5	17.856	11	18.333
Chest pain	14	43.75	12	42.857	26	43.333
Respiratory Symptoms	19	59.375	17	60.714	36	60
Cough	9	28.125	10	35.714	17	28.333
Choking	6	18.75	4	14.285	8	13.333
Dyspnia	4	12.5	3	10.714	5	8.333
Otolaryngeal Symptoms	1	3.125	1	3.571	2	3.333
Neck pain	1	3.125	1	3.571	1	1.667

Fig (19) : The main presenting symptom and other symptoms of each group

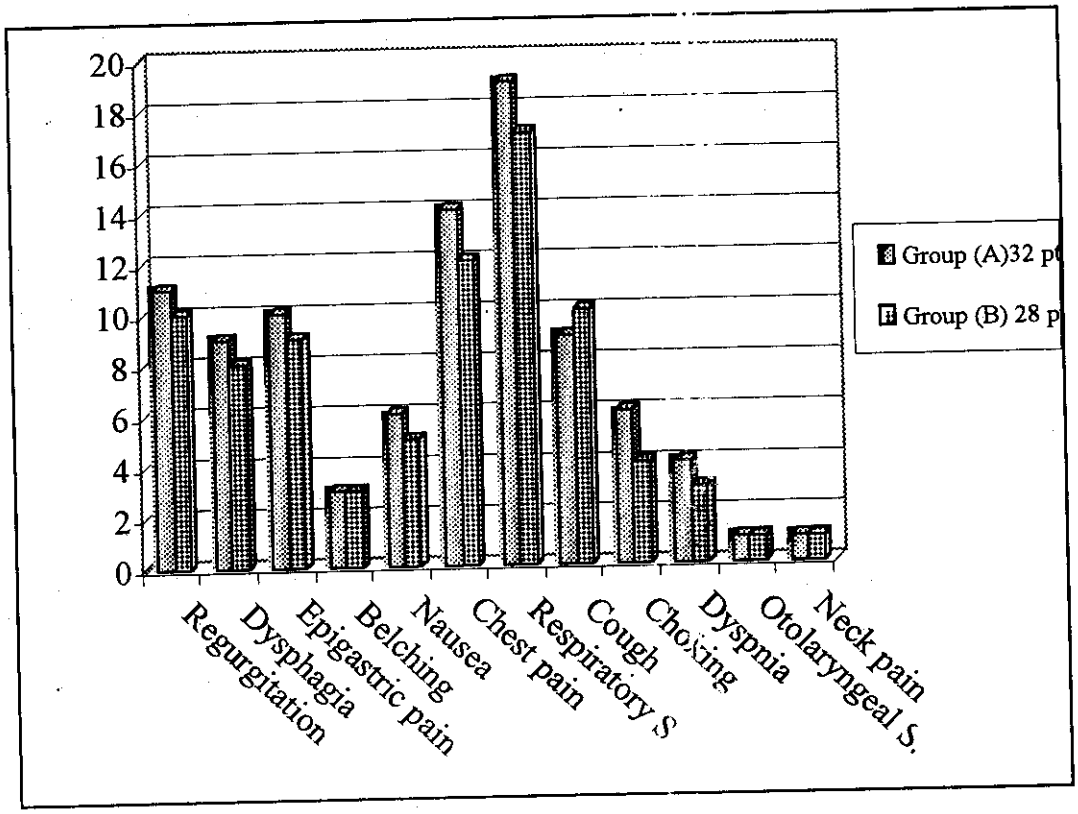


Table (4): Duration of symptoms of each group

Duration of symptoms	Group A 32 pt		Group B 28 pt		Total 60 pt	
	No.	%	No.	%	No.	%
5 - 7 years	4	12.5	5	17.856	9	15
7 - 9 years	10	31.25	6	21.428	16	26.667
9 - 11 years	7	21.875	9	32.142	16	26.776
> 11 years	11	34.375	8	28.57	19	31.666

Fig (20) : The duration of symptoms of each group

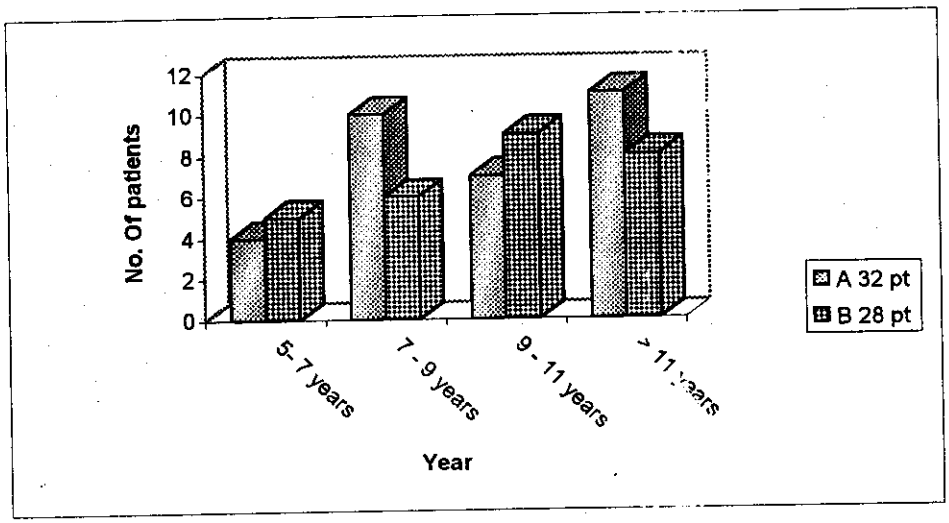
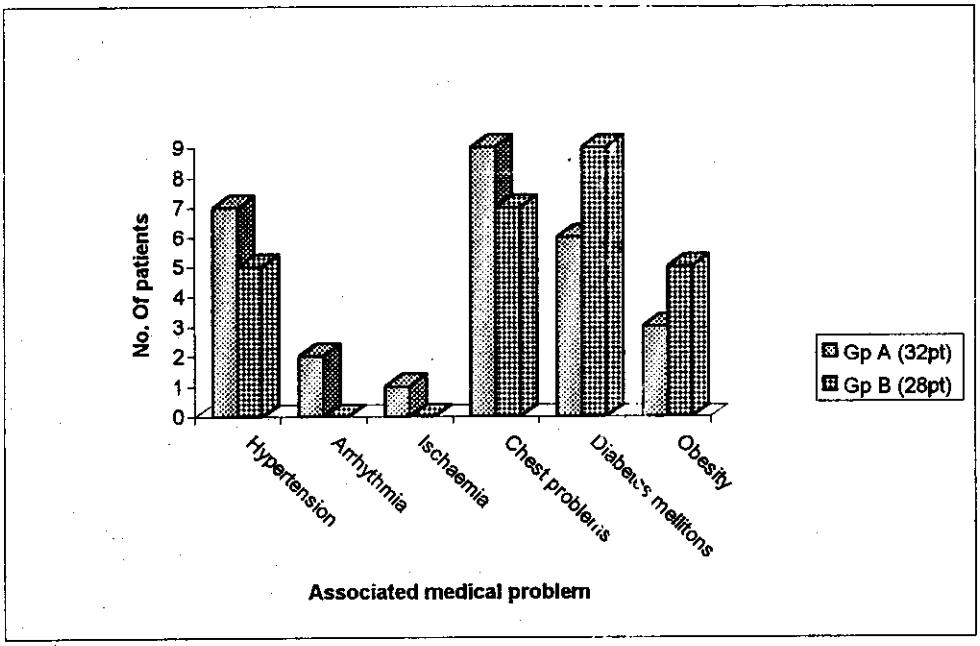


Table (6): Shows Associated medical problems of both groups of patients.

Associated medical Problem	Group A 32 pt		Group B 28 pt		Total 60 pt	
	No	%	No	%	No	%
I- Cardiovascular						
* Hypertension	7	21.875	5	17.857	12	20
* Males	4	12.5	3	10.714	7	11.66
Females	3	9.375	2	7.143	5	8.333
* Arrhythmia	2	6.25	-		2	3.333
Males	1	3.125	-		1	1.667
Females	1	3.125	-		1	1.667
* Ischaemia	1	3.125	-		1	1.667
Males	1	3.125	-		1	1.667
Females	-		-		-	
II- Chest problems						
Wheezy chest	9	28.125	7	25	16	26.667
Males	7	21.875	4	14.28	11	18.333
Females	2	6.25	3	10.714	5	8.334
III- Diabetes Mellitons	6	18.75	9	32.142	15	25
Males	2	6.25	3	10.714	5	8.333
Females	4	12.5	5	21.428	10	16.667
IV- Obesity	3	9.375	5	17.857	8	13.333
Males	1	3.125	2	7.143	3	5
Females	2	6.15	3	10.714	5	8.333

Fig (22): The associated medical problems of both group of patients



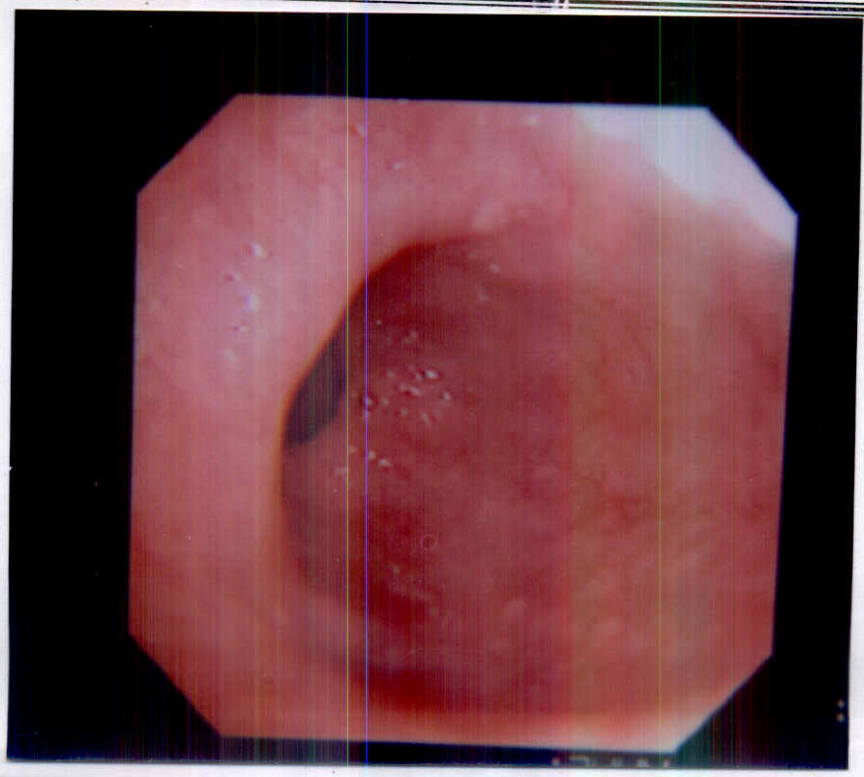


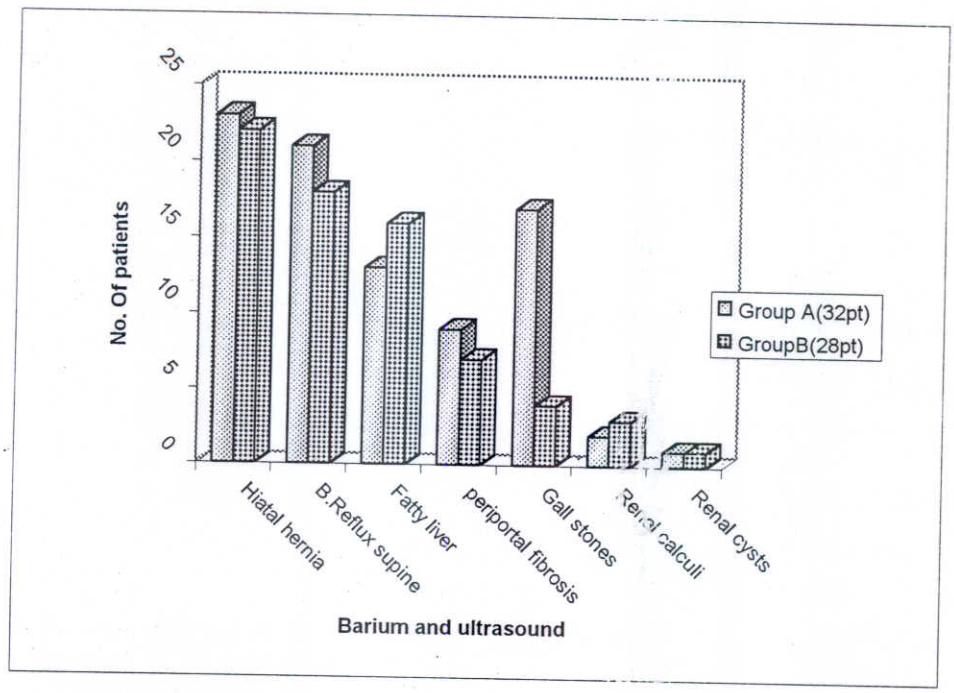
Fig (23 d) : Endoscopice examination of he esophagus shows Grad II esophagitis

Fig (23 e) : Endoscopice examination shows Hiatal hernia (incompetent cardia around the endoscope).

Table (8): Barium and ultrasound findings of each group.

	Group A 32 pt		Group B 28 pt		Total 60 pt	
	No.	*%*	*No.*	*%*	*No.*	*%*
Barium findings						
- Hiatal hernia	23	71.875	22	78.571	45	75
- Barium reflux of from the stomach into esophagus with patients in upright position.	21	65.625	18	65	39	25
Ultrasound findings						
- Fatty liver	13	40.625	16	57.142	29	48.333
- Mild to moderate periportal fibrosis	9	28.125	7	25	16	26.667
- Galls stones	17	53.125	4	14.266	21	35
- Renal calculi	2	6.25	3	10.714	5	8.333
- Renal cysts	1	3.125	1	3.571	2	3.333

Fig (24): Barium and ultrasound findings and the numbers of each group



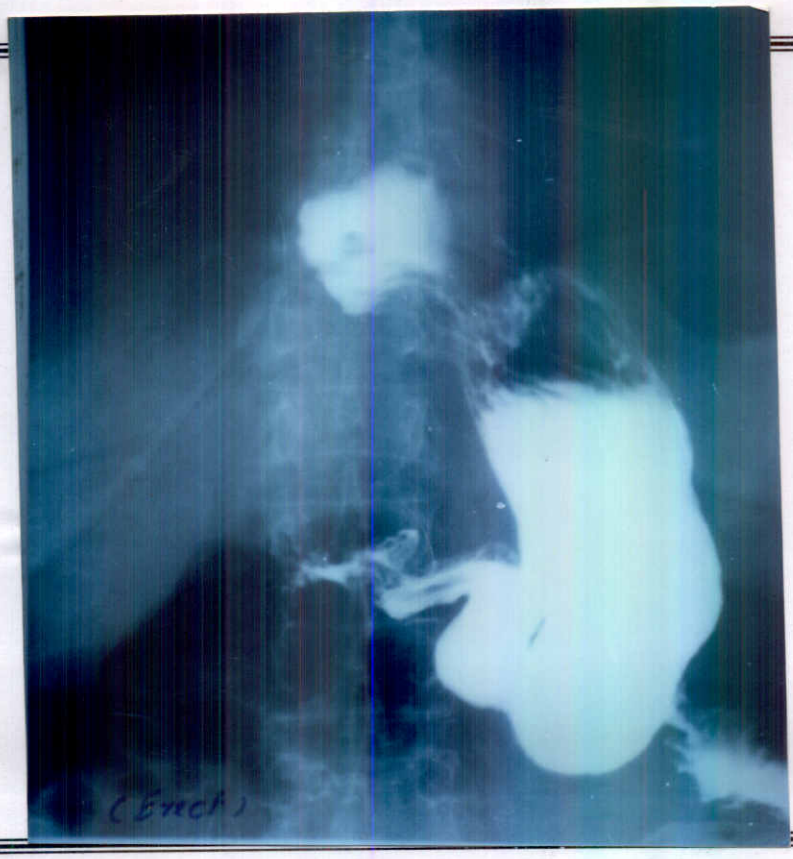


Fig 25 (a,b) : Barium meal in Trendlenburg's and erest positions shows sliding hiatal Hernia

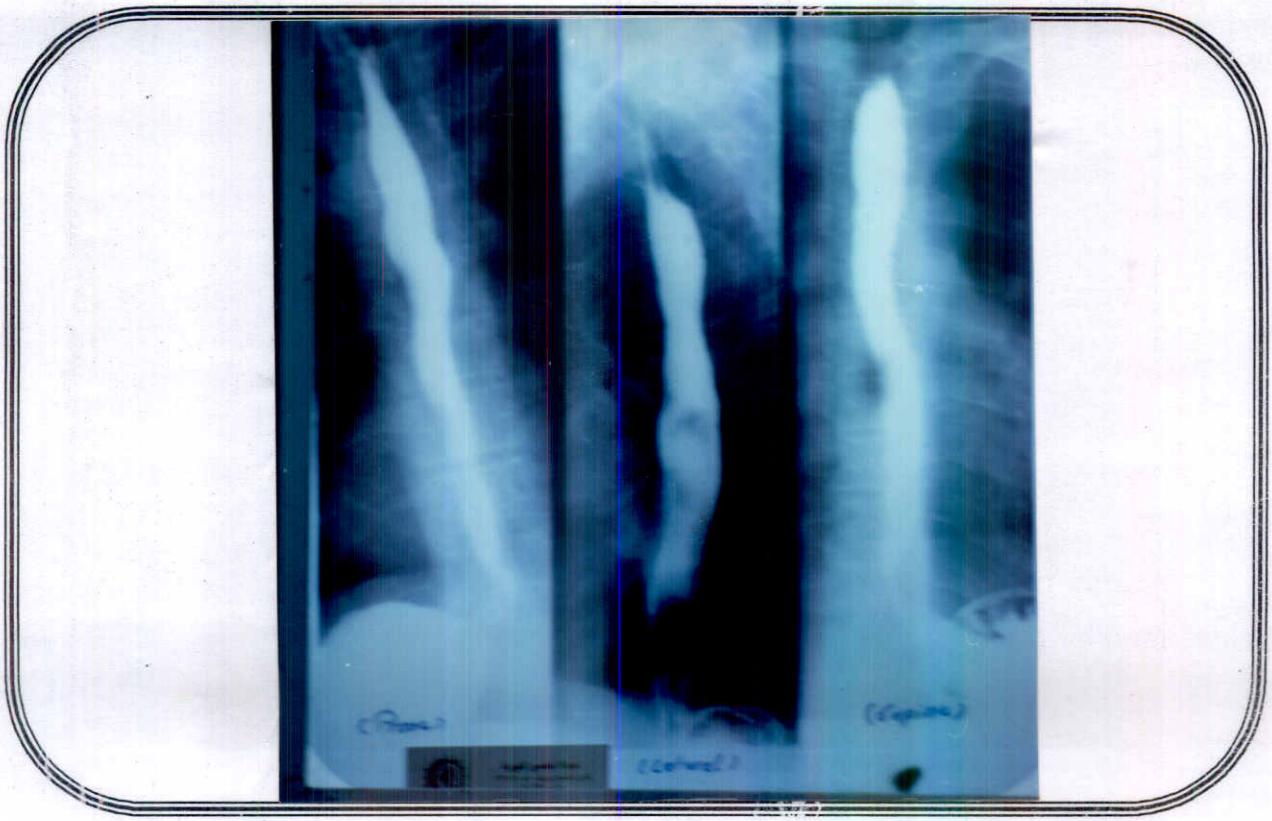
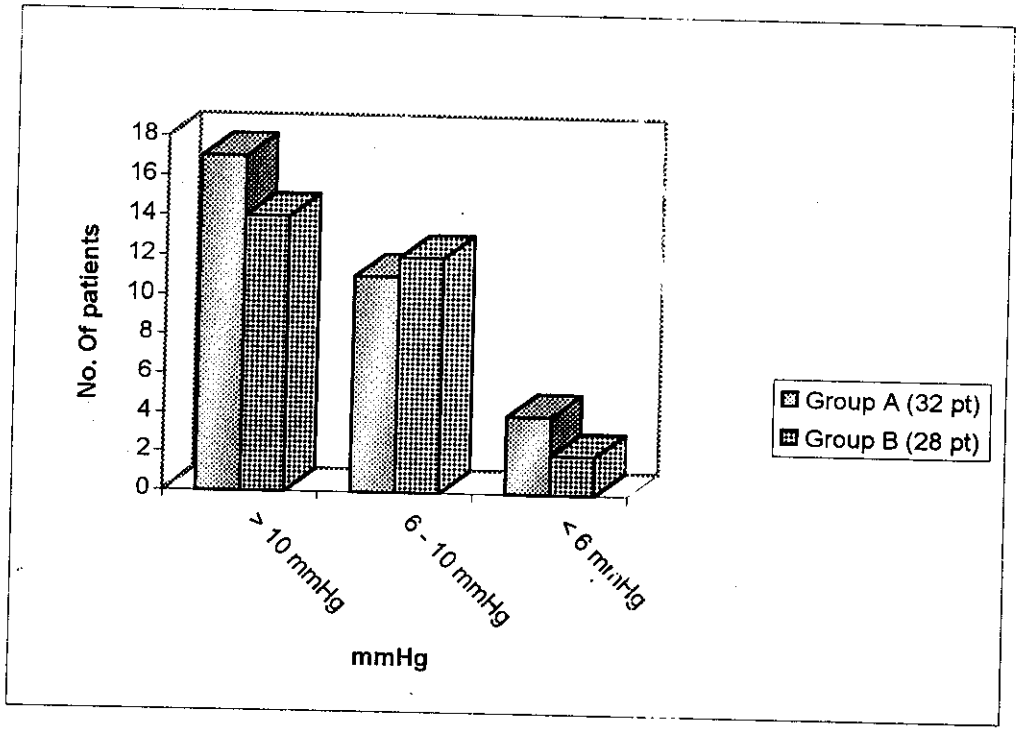


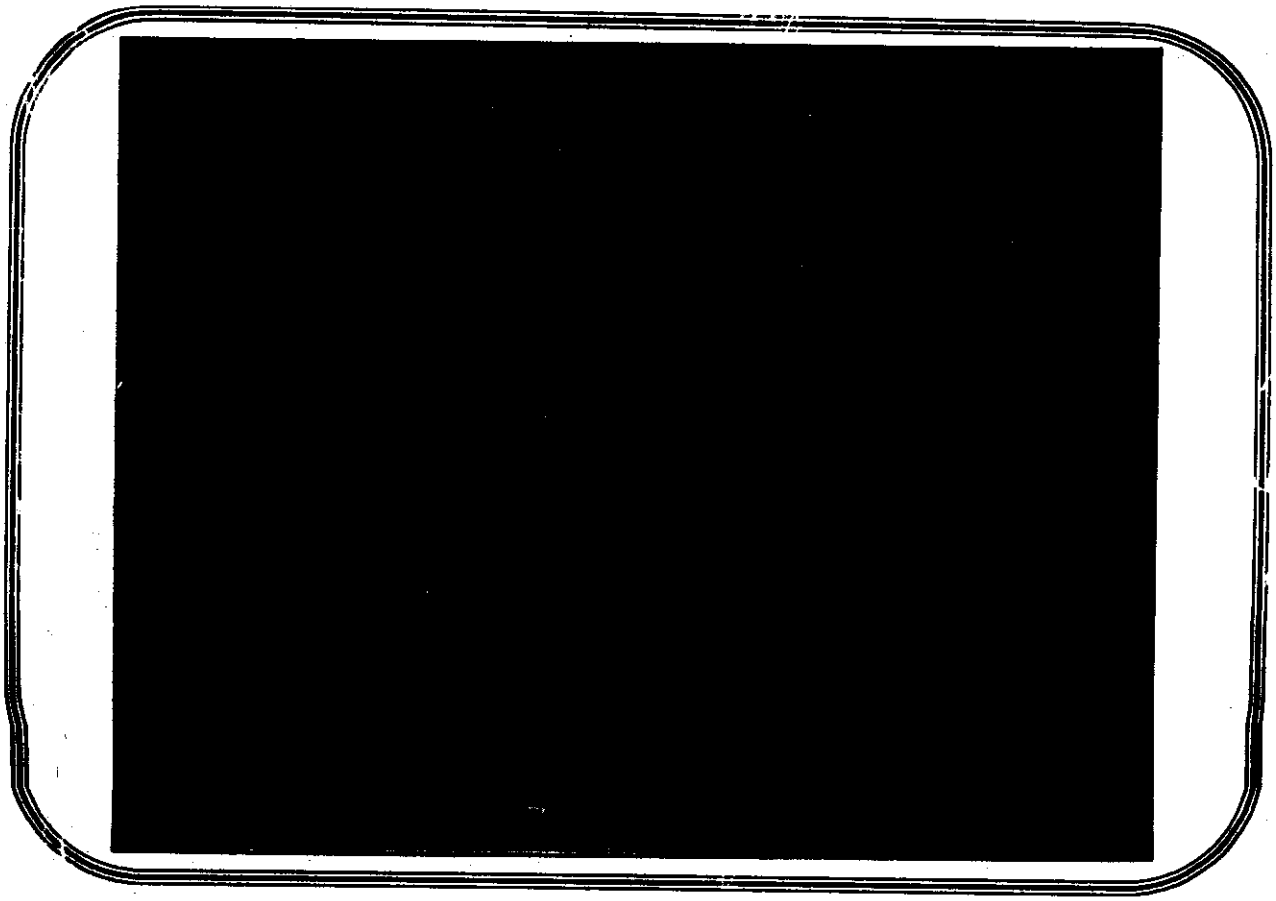
Fig 25 (c) : Reflux of barium into the esophagus in prone, lateral and supine positions.

Table (9): Lower esophageal sphincter pressure of each group

Lower esophageal sphincter	Group A 32 pt		Group B 28 pt		Total 60 pt	
	No.	%	No.	%	No.	%
I - LES pressure > 10 mmHg	17	53.125	14	50	31	51.667
6 - 10 mmHg	11	34.375	12	42.857	23	38.333
< 6 mmHg	4	12.5	2	7.143	6	10
Total	32		28		60	

Fig (26-a) : The lower esophageal sphincter pressure of each group.





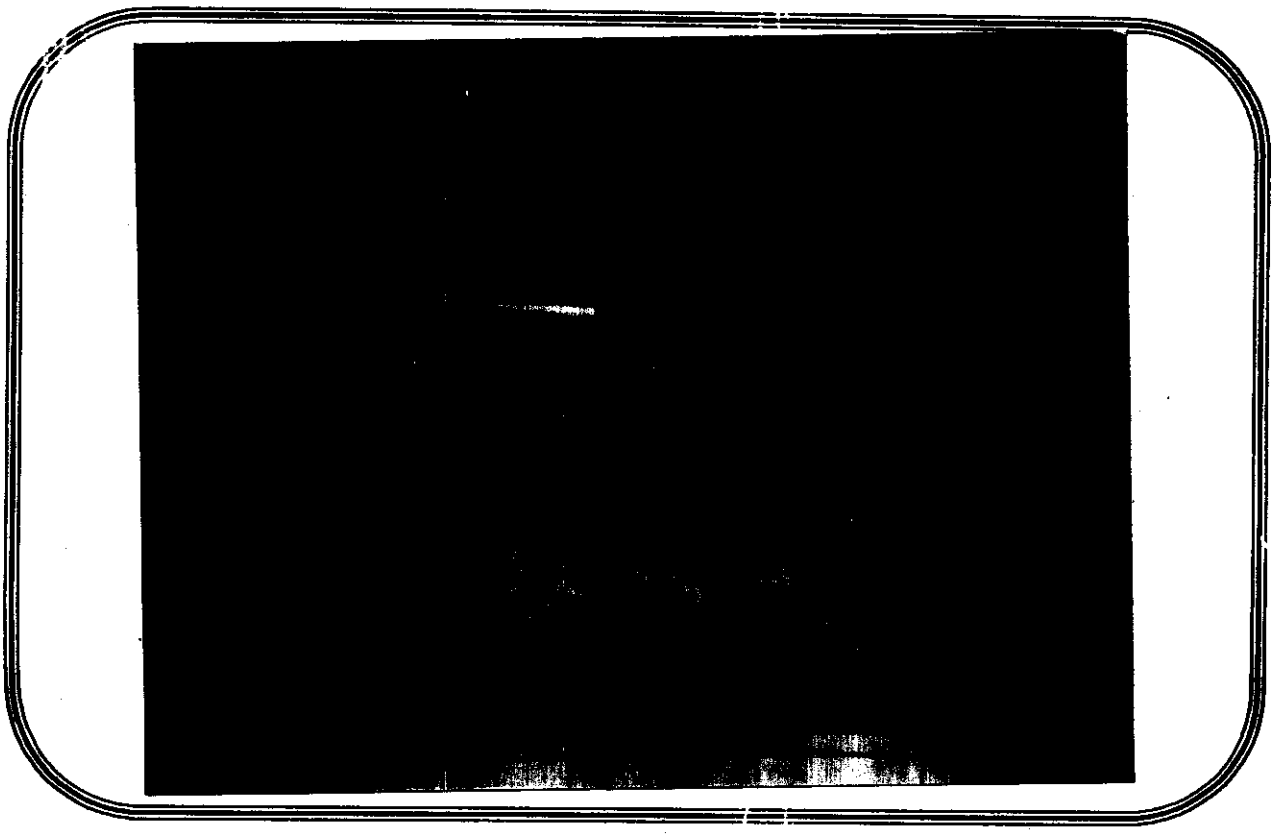


Fig (26 b,c) : Lower esophageal sphineter pressure and PH study .

Table (10): Residual relaxation pressure of each group .

Residual relaxation Pressure	Group A 32 pt		Group B 28 pt		Total 60 pt	
	No.	*%*	*No.*	*%*	*No.*	*%*
2-3 mmHg	9	28.125	8	28.571	17	28.33
1 - 2 mmHg	5	15.625	7	25	12	20
< 1 mmHg	18	56.25%	13	46.429	31	51.667

Fig (27) : Comparsion between residual relaxation pressure of each group.

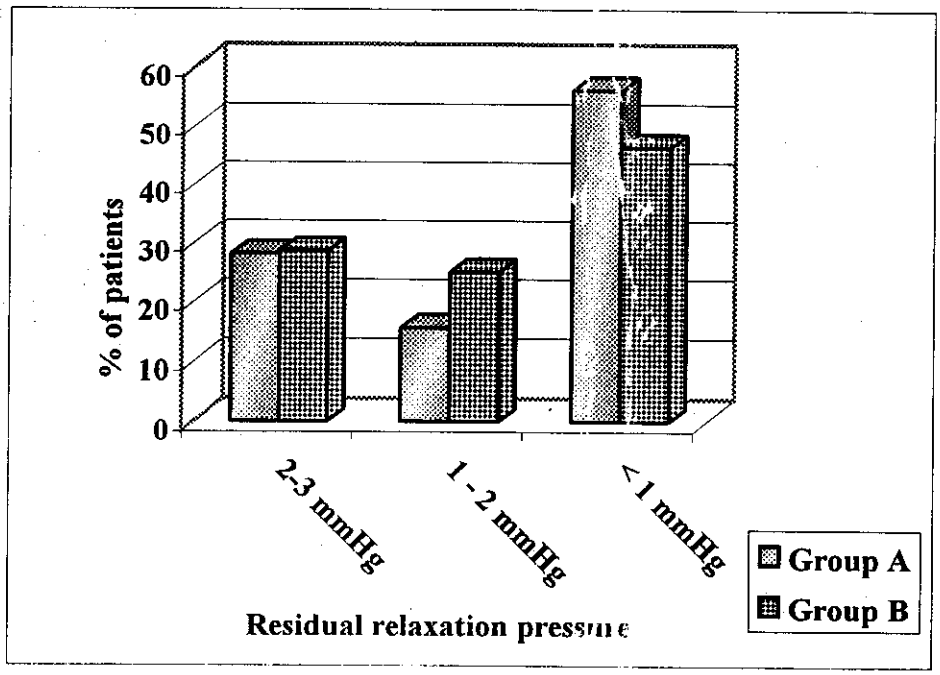
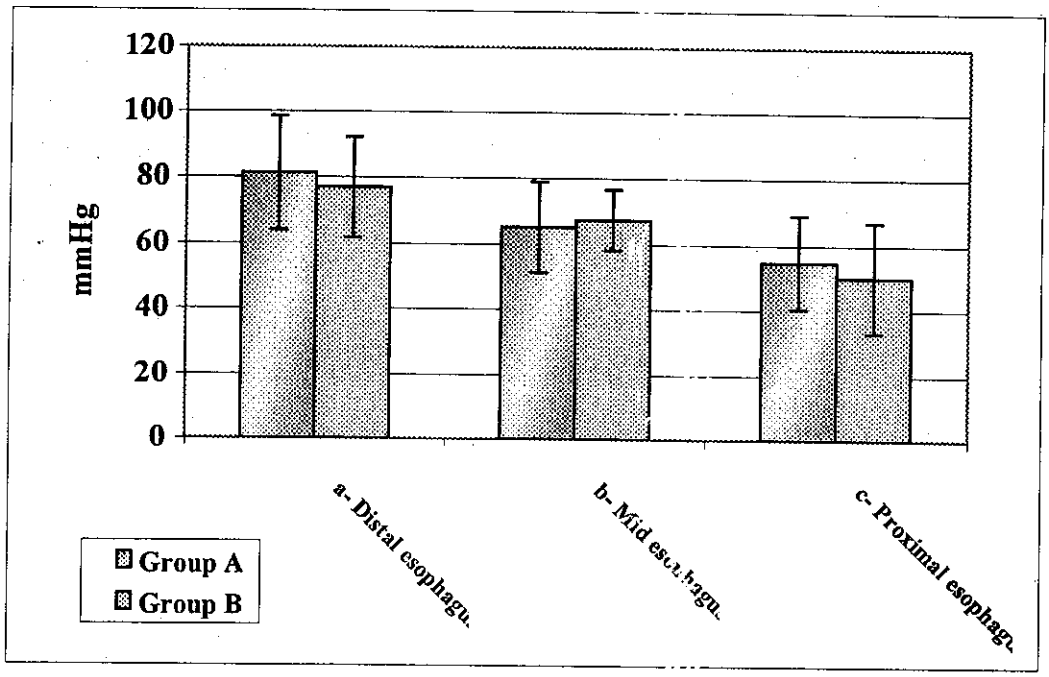
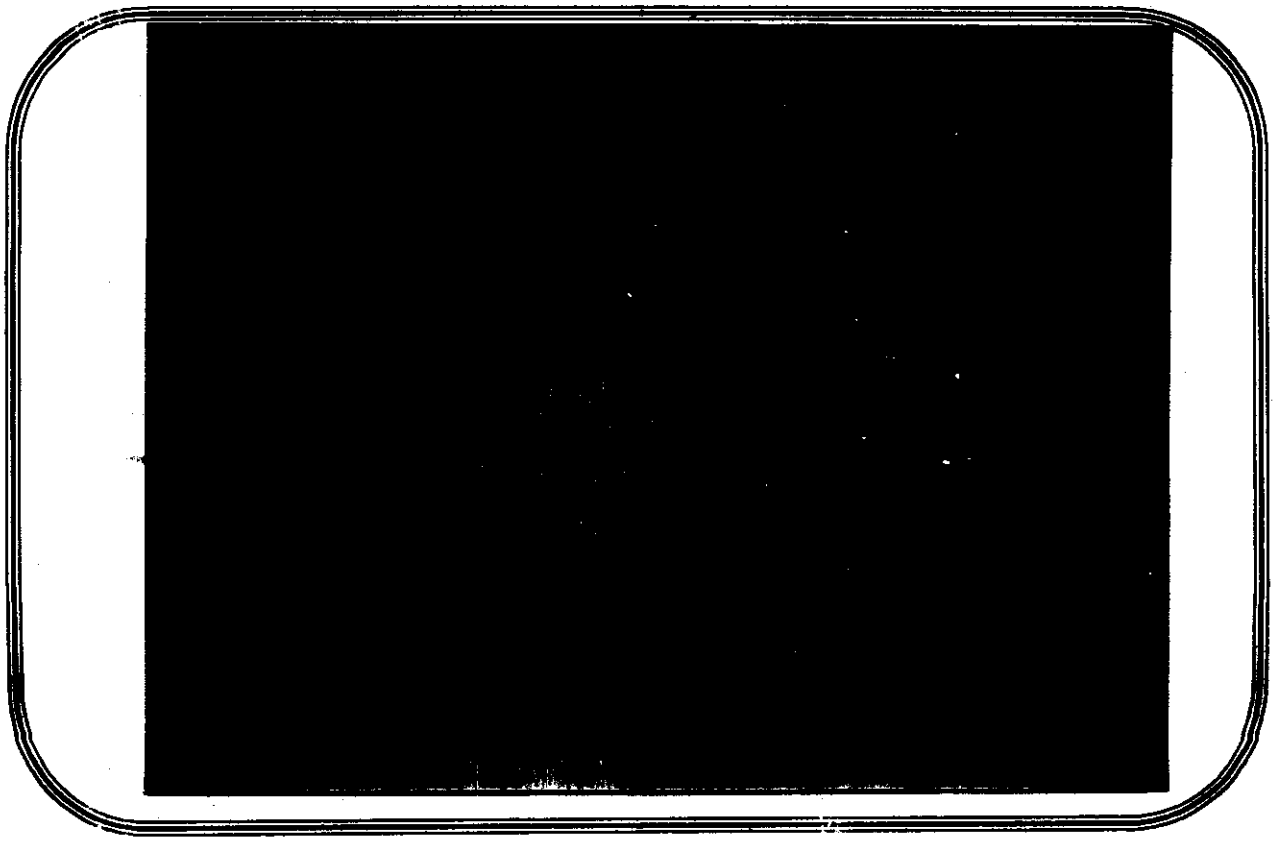


Table (11): Esophageal body functions

Esophageal body functions	Group A (32 patients)	Group B (28 pt).
I Amplitude of the peristaltic wave of :		
a- Distal esophagus	81.2 ± 17.7 (mmHg)	76.9 ± 15.3 mmHg
b- Mid esophagus	65.1 ± 13.8 (mmHg)	67.3 ± 9.2 mmHg
c- Proximal esophagus	54.7 ± 14.3 (mmHg)	50.1 ± 16.8 mmHg
II Duration of peristatsis (Seconds)	2.95 ± 1.7 (Sec)	3.01 ± 1.2 (Sec)
III Velocity of peristalsis	4.094 ± 1.20 cm/sec	4.127 ± 1.37 (cm/sec)

Fig (28-a) :Comparsion between Esophageal body functions of each group.





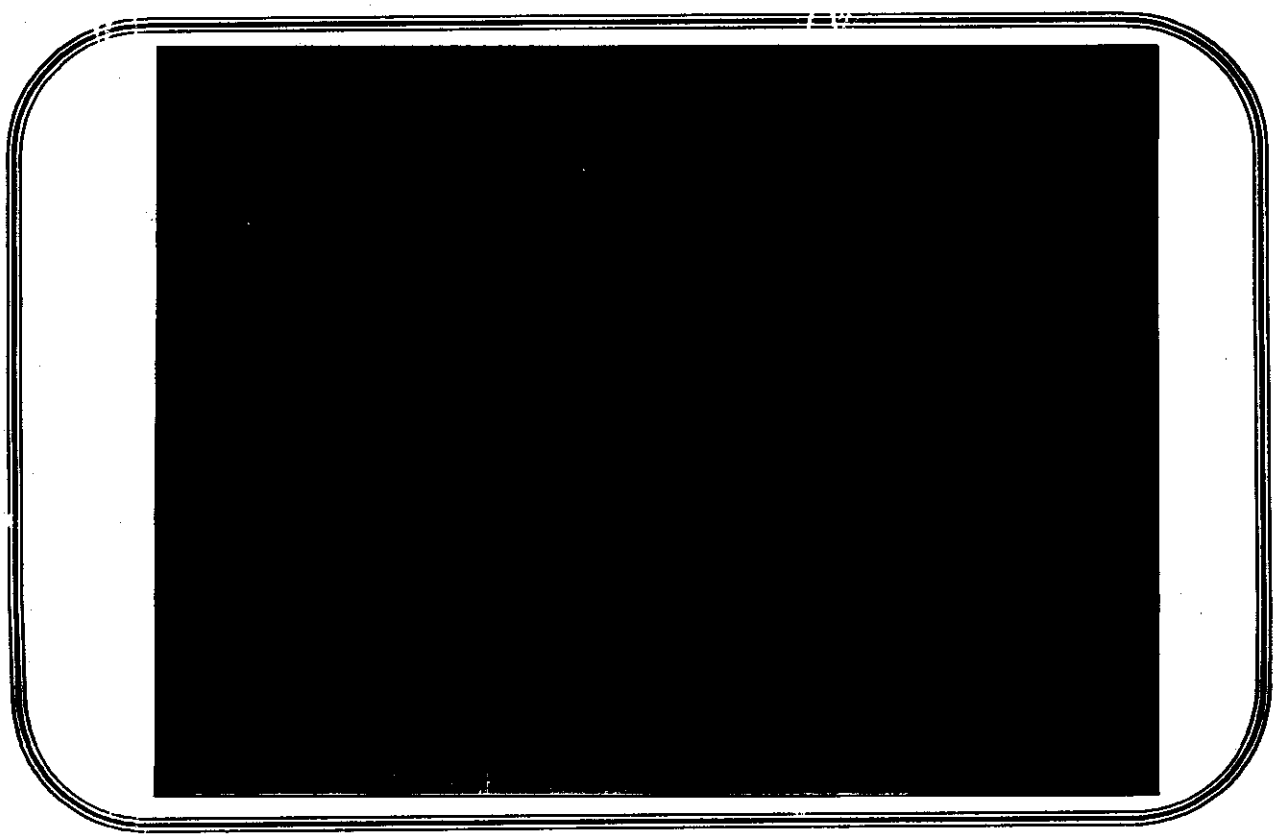


Fig (28 b-c) : Esophageal body measurements and PH study.

Table (12): The relation between duration of symptoms and lower esophageal sphincter pressure

Duration of symptoms	LES Pressure	
	Mean ± SD (group A) 32pt	Mean ± SD group B (28 pt)
5 – 7 years	13.2 ± 0.97	14.08 ± 0.68
7 – 9 years	11.5 ± 1.21	10.49 ± 1.52
9 – 11 years	8.96 ± 1.67	9.03 ± 1.45
> 11 years	6.34 ± 1.95	5.89 ± 1.13

P < 0.05

Fig (29): The relation between duration of symptoms and lower esophageal sphincter pressure of each group

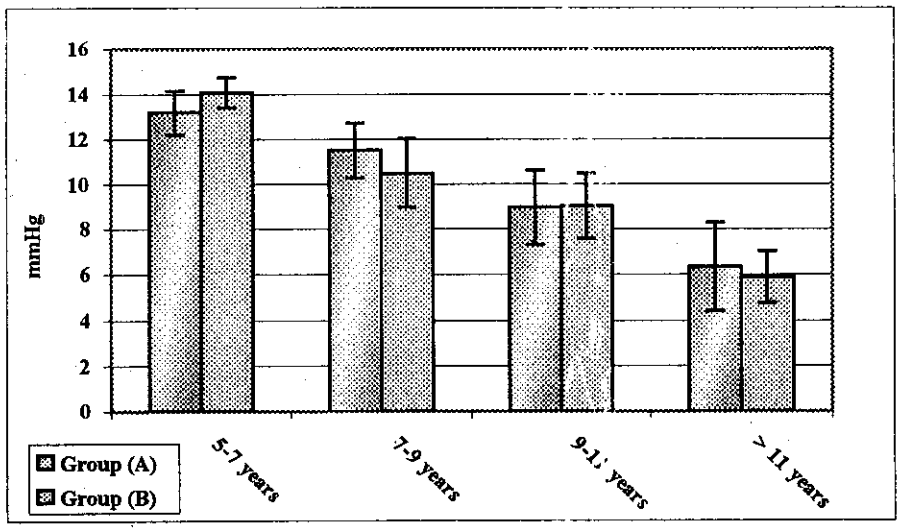


Table (13) : 24 hours pH study of both groups in relation to posture.

24 hs pH study	group A (32 pt)		Group B (28 pt)		Total (60 pt)	
	No	%	No	%	No	%
Supine refluxers	8	25	6	21.429	14	23.333
Upright refluxers	3	9.375	5	17.857	8	13.333
Commined refluxers	21	65.625	17	60.714	38	63.334

Fig (30) : Comparison between 24 hours pH study of both group in relation to posture

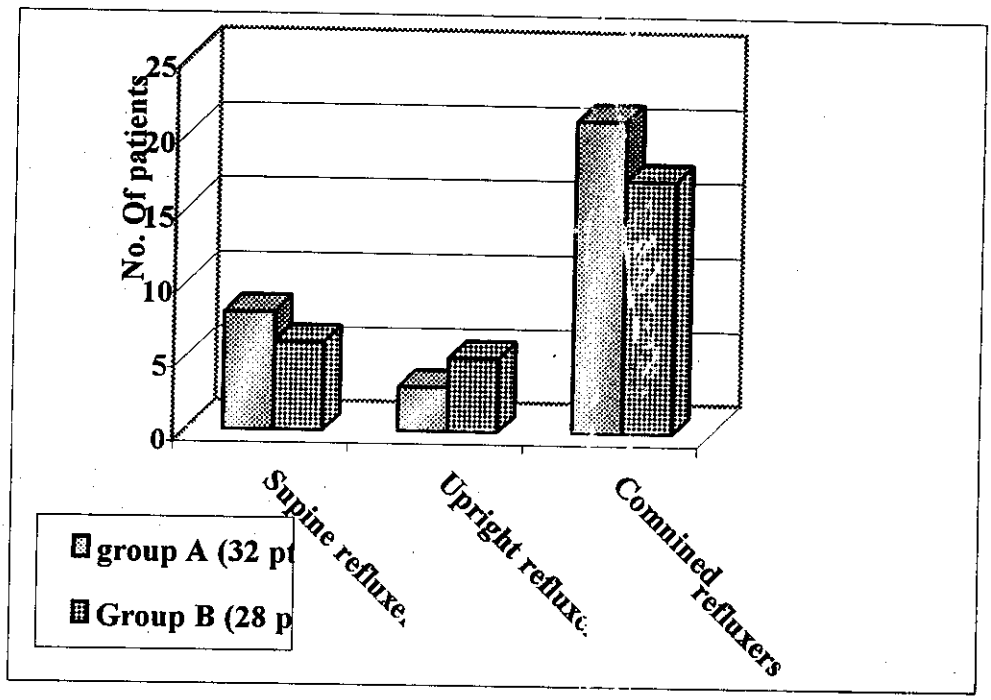
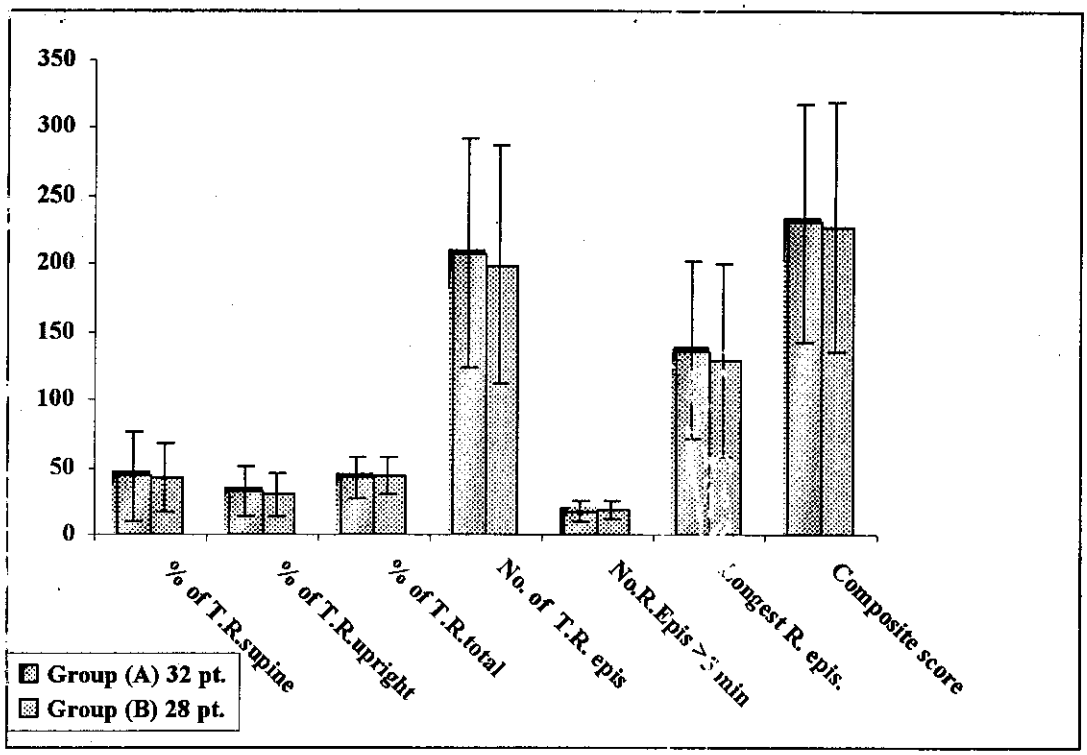


Table (14): The ampulatory 24 hour esophageal pH monitoring indices of both groups.

PH study	*Group A (32 pt)*	*Group B (27 pt)*
% of time reflux supine (Per the whole time spent supine)	Mean 43.78 SD ± 32.75	Mean 42.86 SD ± 25.15
% of time reflux upright (Per the whole time spent upright)	Mean 32.66 SD ± 18.34	Mean 30.16 SD ± 15.86
% of time reflux total (Per 24 hours)	Mean 42.69 SD ± 15.02	Mean 44.13 SD 13.67
Number of total reflux episodes	Mean 207.91 SD ± 84.05	Mean 199.56 SD ± 87.47
Number of reflux episodes > 5 min.	Mean 17.60 SD ± 7.12	Mean 18.84 SD ± 6.57
Longest reflux episode (min.)	Mean 136.43 SD ± 65.54	Mean 128.87 SD ± 71.93
Composite score	Mean 230.36 SD ± 87.0	Mean 227.84 SD ± 91.23

Fig (31):The ampulatory 24 hour esophageal pH monitoring indices of both groups.



There was significant relation between regurgitation as a symptom of G.E.R.D. and 24 hours esophageal monitoring indices as patients with regurgitation had higher 24 hour pH monitoring indices than patients without regurgitation. This relation had been tabulated in table (15) Fig (32).

There was significant relation between the duration of symptoms and 24 hours esophageal pH monitoring indices as follows:

- % of time reflux upright was more with increase duration of symptoms but not significant .
- % of time reflux supine was significantly high with increase duration of symptoms ($P < 0.01$).
- % of time reflux total was more with increase duration of symptoms but not significant.
- No significnat relation between duration of symptoms and number of episodes more than 5 minutes, duration of longest reflux episode or number of reflux episodes. In 24 hours.

All data are summarized in table (16). Fig 33 (a-g).

Table 17 Fig (34a-e): Shows operative data of each group.

Table (18 Fig (35) : Shows the incidence of improvement of patients of each group after surgery (symptomatic & endoscopic) among one year follow up.

Table (15): The relation between regurgitation and ambuletory 24 hour esophageal pH monitoring indices.

PH study	Patients with regurgitation (21) pt.	Pt without regurgitation	
% of time reflux supine	Mean 53.00% SD ± 23.24%	30.54% ± 23.67	T test 2.30 P < 0.05
% of time reflux upright	Mean 42.75% SD ± 11.09	21.83% ± 18.79	T test 2.94 P < 0.01
% of time reflux total	Mean 53% SD ± 23.24	30.54% ± 23.67	T test 2.307 P < 0.05
Number of total reflux episodes	Mean 188.37 SD ± 60.93	192.22 ± 90.03	T test 0.11 P Not sign.
Number of reflux episodes that lasts > 5min.	Mean 17.25 SD ± 7.75	13.81 ± 8.62	T test 0.987 P not sign.
Longest reflux episode (Sec)	Mean 170.50 SD ± 37.70	101.04 ± 73.60	T test 2.53 P < 0.05
Composite score	Mean 294.52 SD ± 70.76	161.809 88.41	T test 3.81 P < 0.01

Fig (32):The relation between regurgitation and ambuletory 24 hour esophageal pH monitoring indices.

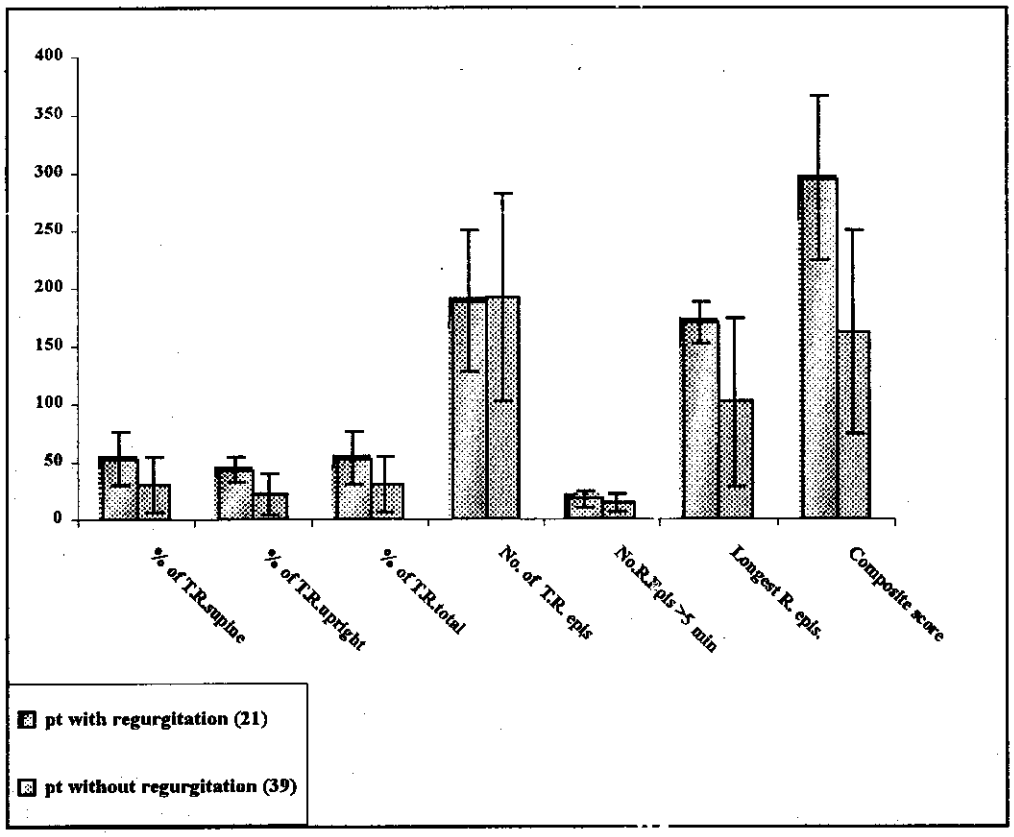


Table (16) : The relation between duration of symptoms and PH monetoring indecis

Duration of symptoms	% of time reflux supine		% of time reflux upright		% of time reflux total		Number of total reflux episodes		Number of reflux episodes >5min		Duration of longest reflux episode		Composite score	
	group A (32 pt)	group B (28 pt)	group A (32 pt)	group B (28 pt)	group A (32 pt)	group B (28 pt)	group A (32 pt)	group B (28 pt)	group A (32 pt)	group B (28 pt)	group A (32 pt)	group B (28 pt)	group A (32 pt)	group B (28 pt)
5 - 7 years Mean	21.22%	21.69%	19.44%	20.13%	23.66%	24.31%	192.66	206.78	10.37	9.98	129.66	131.53	140.38	151.17
± SD	6.13	5.95	7.09	6.85	6.21	5.07	29.59	23.62	1.43	1.67	29.59	27.63	30.14	22.07
7 - 9 years Mean	35.58%	37.34%	24.57%	23.92%	32.67%	33.98%	159.41	164.56	14.5	13.63	159.41	156.96	198.61	203.19
± SD	7.49	8.96	6.9	5.17	5.3	4.57	22.07	18.29	1.01	1.93	22.07	24.39	30.26	25.67
9 - 11 years Mean	51.57%	53.11%	31.85%	33.41%	43.71%	45.15%	253.16	231.07	17.85	16.63	183.21	175.18	229.32	223.58
± SD	7.3	9.74	5.21	3.69	6.23	5.07	25.12	13.11	2.99	1.03	25.12	31.28	31.84	34.26
> 11 years Mean	70.51%	68.03%	46.50%	47.21%	57.50%	56.69%	158.5	169.32	10.32	11.31	158. 50	163.12	301.6	293.6
± SD	4.49	3.01	4.5	3.62	0.5	1.02	25.5	19.41	1.33	1.12	24.51	32.16	22.89	12.13

Fig (33 a – g) : Comparsion between pH monitor indices of each group

Fig (33 a): The relation between duration of symptoms and % of time reflux supine of both groups

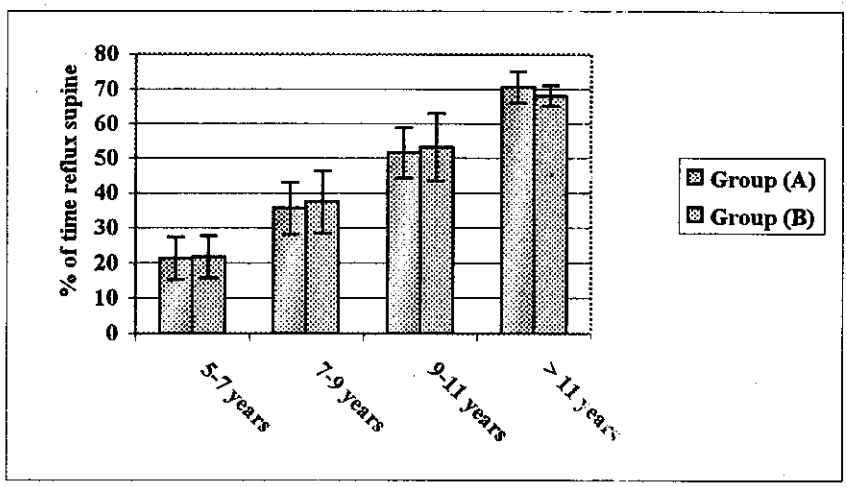


Fig (33-b): The relation between duration of symptoms and % of time reflux upright of both groups

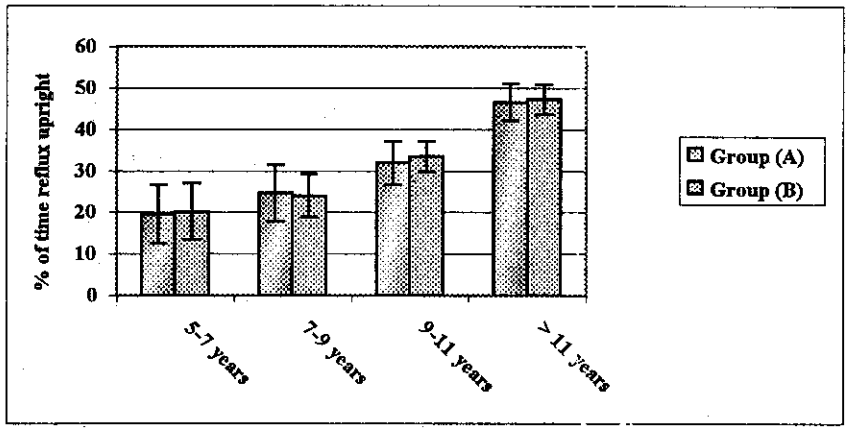


Fig (33-c) : The relation between duration of symptoms and % of time reflux total of both groups

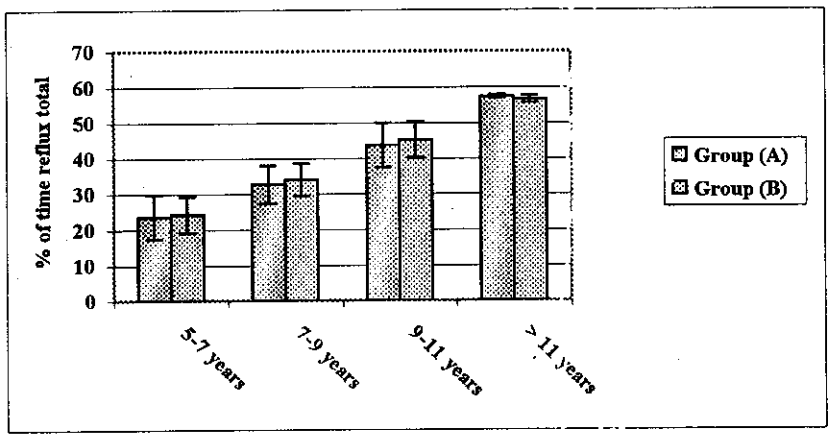


Fig (33-d) : The relation between duration of symptoms and number of total reflux episodes botn groups

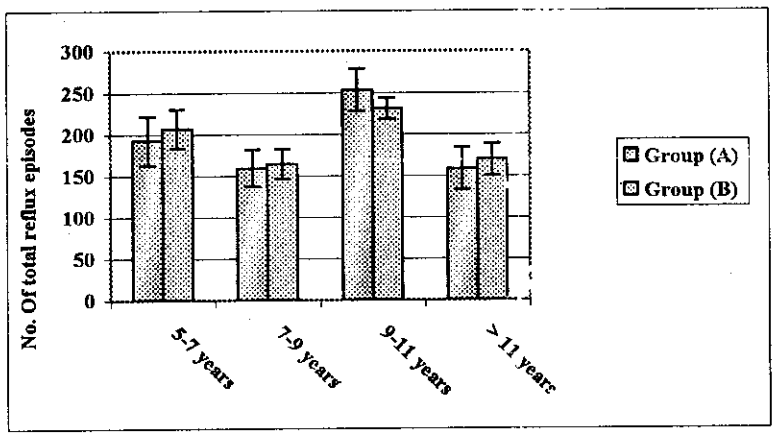


Fig (33-e) : The relation between duration of symptoms .and number of reflux episodes lasts > 5 min

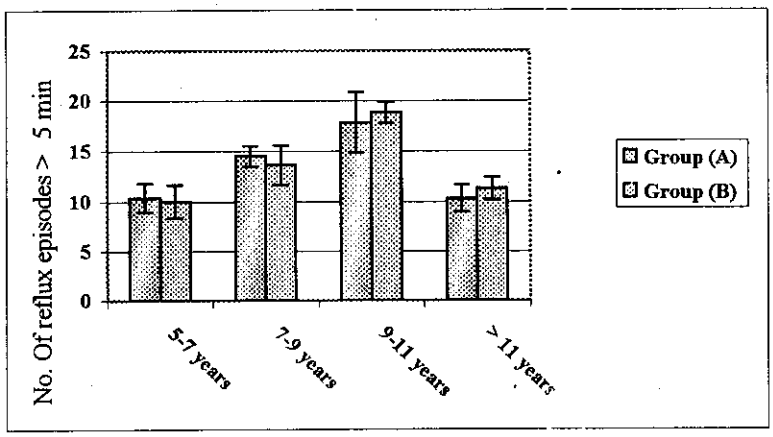


Fig (33-f) : The relation between duration of symptoms .and longest reflux episode

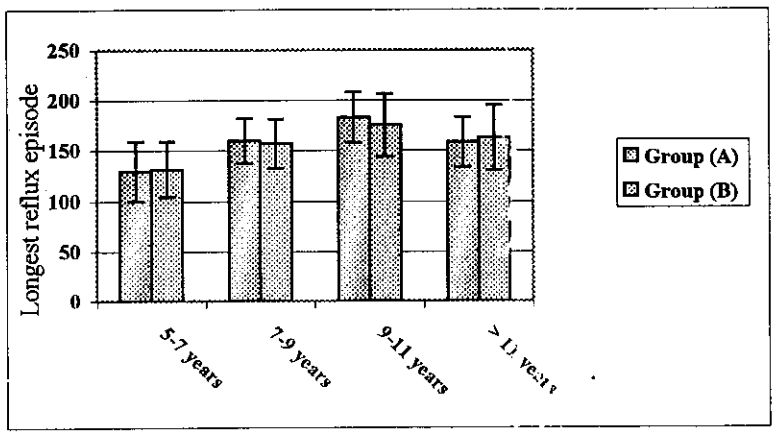


Fig (33-g) : The relation between duration of symptoms and compositescore of each group

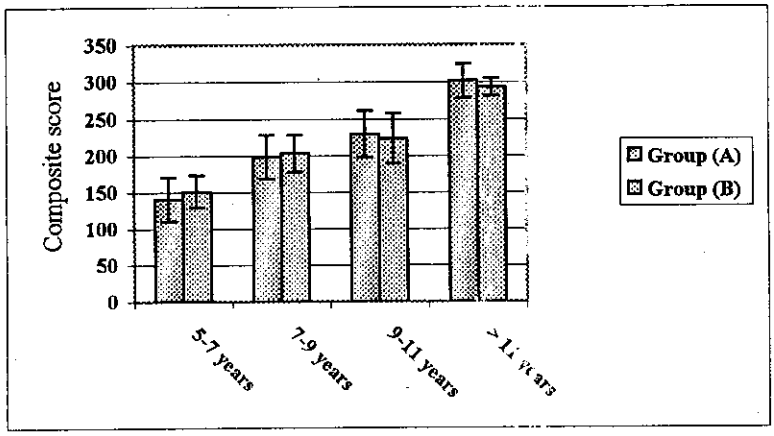


Table (17): Details of operative data among the two groups of patients

Operative	Group A (32 pt)	Group B (28 pt.)
I Operative time	105 ± 67 min Mean 93 min	187 ± 92 min Mean 125 min.
II Hospital stay (days)	7-10 mean 7.8	2-5 mean 3.5
III Intraoperative complication		
A- Bleeding		
* Shortgastric vessels	2 (6.25%)	1 (clipped)
*Branche of Itphrenic A	-	1 (3.571%)
* From trochar site	-	3 (10.714%)
B- Injuries		
* Spleen	1 (3.125%)	1 (sutured)
* Stomach	1 (3.125%)	1
* Esophagus	-	1 (3.571%)
* Vagus nerve	1 (3.125%)	-
* Ltlobe of liver	-	1 (3.57%)
* Colon	-	-
IV Post operative complication		
* Chest infection	4 (12.5%)	3 (10.714%)
* Wound infection	4 (12.5%)	2 (7.148%) (umbilical)
* Incisional Hernia	2 (6.25%)	0
* Transhiatal Herniation	0	1 (3.571%)
* Pneumothorax	0	1 (3.571%)
* Mortality	0	0

Fig (34) (a-e) : Details of operative data among the two groups of patients

Fig (34 a) : Mean operative time of each group.

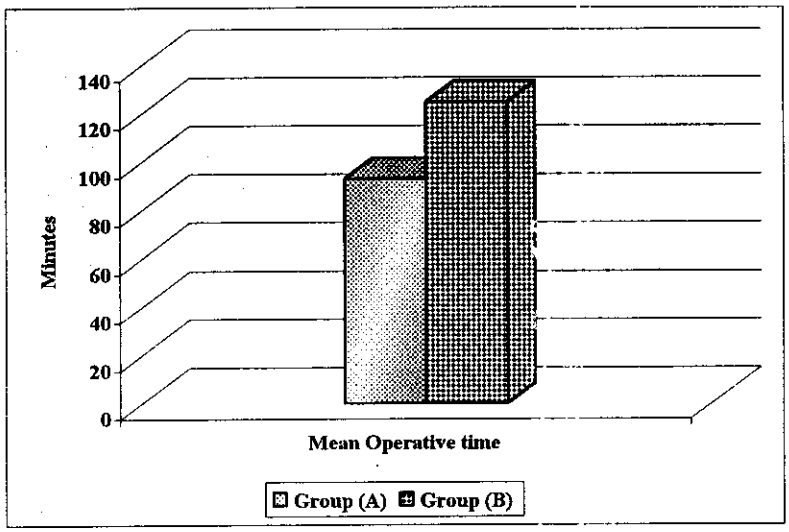


Fig (34 b) : Mean Hospital stay of each group

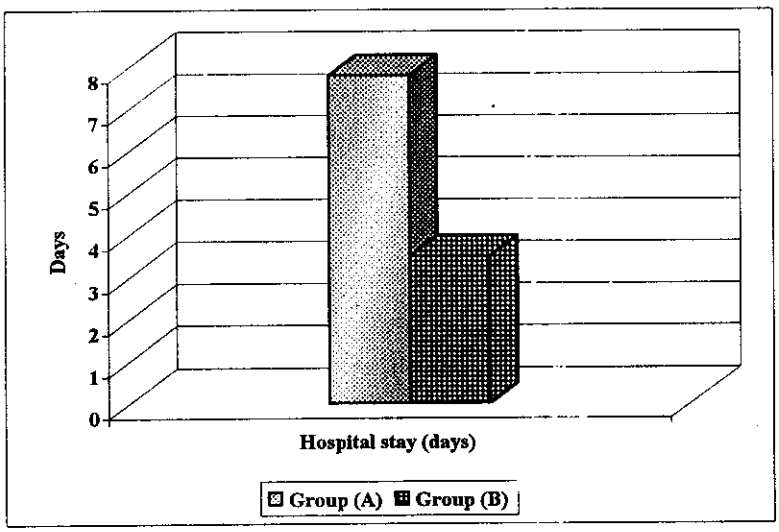


Fig (34 c) : Intraoperative complications (bleeding)

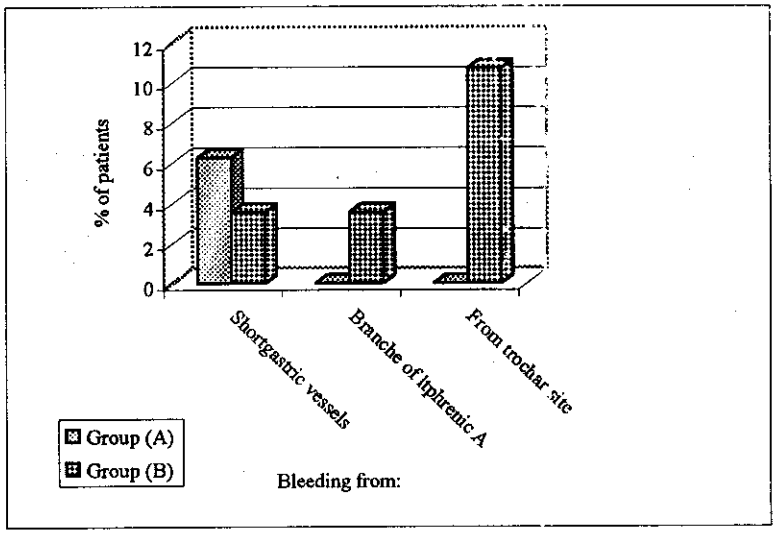


Fig (34 d) : Inraoperative complications (injuries)

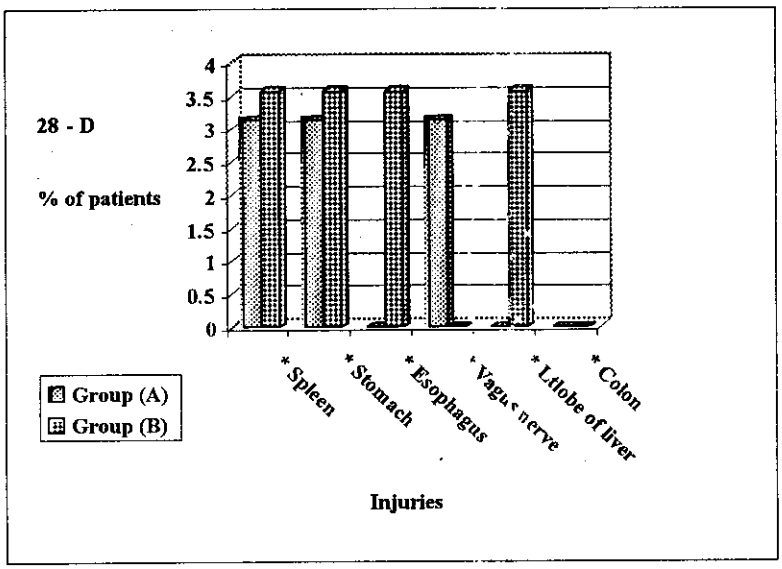


Fig (34 e) : Postoperative complications

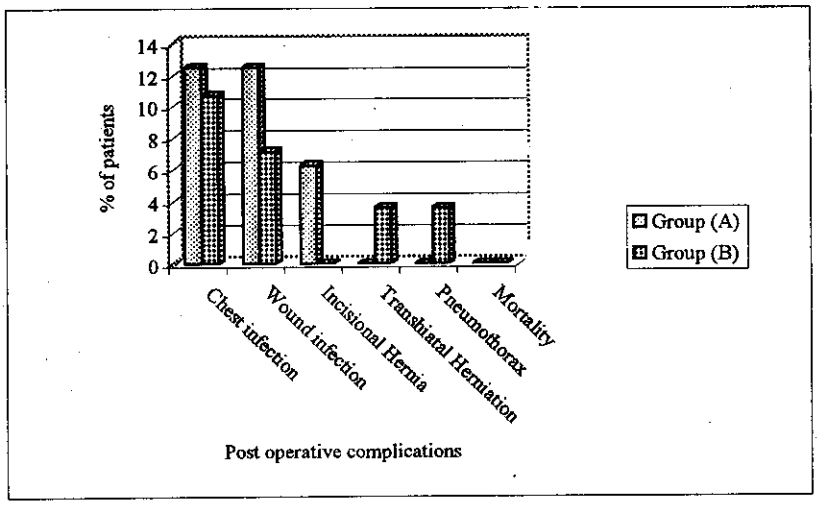
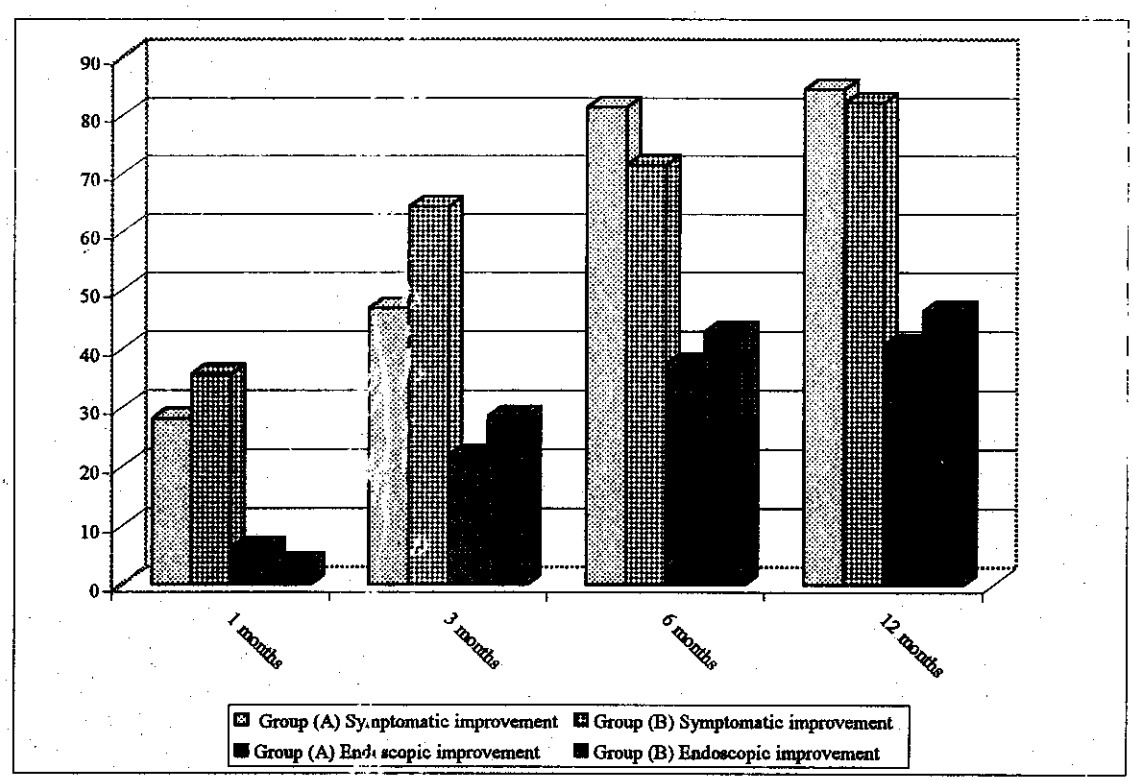


Table (18): The incidence of improvement (Number and percentage of both groups among one year follow up postoperatively either symptomatically or endoscopically.

Post operative Period	Group A (32 patients)		Group B (28 patients)	
	Symptomatic improvement	Endoscopic improvement	Symptomatic improvement	Endoscopic improvement
1 month	9 (28.125%)	2 6.25%	10 35.714 %	1 3.571
3 months	15 46.875%	7 21.875%	18 64.285%	8 28.517%
6 months	26 81.25%	12 37.5%	20 71.42%	12 42.857%
12 months	27 84.375%	13 40.62%	23 82.143%	13 46.428%

Fig (35) : The percentage of improvement among one year follow up postoperatively either symptomatically or endoscopically.



We noticed 5 pt of 32 operated conventionally and 5 pt of 28 managed laparscopically still symptomatizing. Also endescopic follow up shows no endoscopic improvement.

Table (19) Fig 36:Shows comparison between the pre-and post operative symptoms of both groups.

Table (20) Fig 37:Shows The New postoperative symptoms that appears in patients of each group

Table (19): Shows comparison between the pre- and post-operative symptoms (after one year) of patients of both groups.

Symptoms	GP A 32pt		GP.B. 28pt	
	Pre operative	Post operative	Pre operative	Post operative
1- Heart burn	27	3(11.111%)	24	2(8.333%)
2- Regurgitation	11	Zero	10	Zero
3- Dysphagia	9	2(22.22%)	8	1(12.5%)
4- Epigastricpain	10	Zero	9	Zero
5- Chestpain	14	1(7.143%)	12	1(8.333%)
6- Resp. symptoms	19	5(26.316%)	17	4(23.529%)
7- Nausea	6	1(16.667%)	5	1(20%)
8- Belching	3	Zero	3	Zero

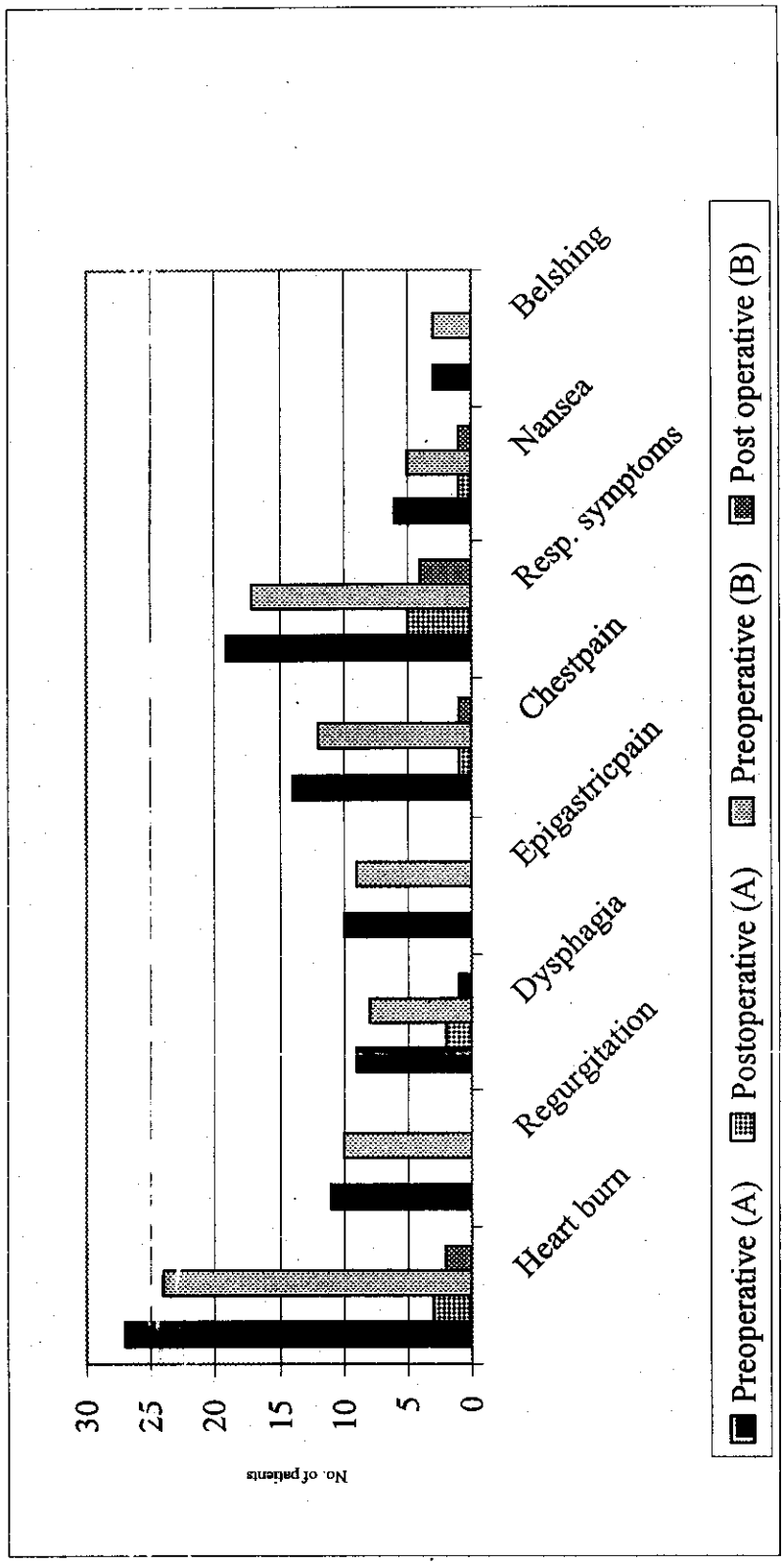


Fig (36) : Comparison between the pre-and post- operative symptoms (after one year) of patients of both groups.

Table (20) : The New postoperative symptoms that appears in patients of each group

Symptoms	GP A		GP B	
	After 1 month	After 1 year	After 1 month	After 1 year
1-New onset dysphagia	4pt (12.5%)	2pts (mild) (6.25%)	7pts (25%)	2pts (mild) (7.143%)
2-Inability to belch	5 (15.625%)	Zero(improved after teaching them not to swallow air with meals	6 (21.429%)	Zero(improved after teaching them not to swallow air with meals
3-Inability to vomit	2 (6.25%)	2 (6.25%)	3 (10.714%)	3 (10.714%)
4-Diarrhoea	1 (3.125%)	1 (3.125%)	1 (3.571%)	1 (3.571%)