RESULTS

RESULTS

The results gained from our work have been gathered, analyzed and collectively tabulated in serial tables as follows :

1- Age and sex :

This study included 100 patients 76 males (76%) and 24 females (24%) with age range 18-66 years with a mean (40.28 ± 11.84). These patients were admitted with 3rd and 4th degree haemorrhoidal disease. The patients were divided randomly into 4 groups through a computer generated random table.

Group I, included 25 patients with 22 males (88%) and 3 females (12%) and age range between 18 years and 66 years with a mean 40.28 ± 11.84. All patients of this group underwent stapler haemorrhoidectomy. (Table 1 &2) (Fig. I & II).

Group II, included 25 patients with 17 males (68%) and 8 females (32%) and age range between 22 years and 55 years with a mean 33.20 ± 8.69. All patients of this group underwent Rubber band ligation. (Table 1 &2) (Fig. I & II).

Group III, Included 25 patients with 18 males (72%) and 7 females (28%) and age range between 18 years and 60 years with a mean 33.40 ± 12.14. All patients of this group underwent Good-sall's stitch technique (Table. 1 & 2) (Fig. I & II).

Group IV, include 25 patients with 19 males (76%) and 6 females (24%) and age range between 20 years and 65 years with a mean 35.36 ± 13.37. All patients of this group underwent conventional haemorrhoidectomy (Table 1& 2) (Fig. I & II).

(Table 1 &2) and (Fig. I & II) show that there is no significant difference among the studied groups regarding the age and the sex.

Table (1) : Comparison among the studied groups regarding age.

Age (Ys) / Studied groups	Range	Mean value $(\overline{X})$	± S.D.
Group I	18.0 – 66.0	40.28	± 11.84
Group II	22.0 – 55.0	33.20	± 8.69
Group III	18.0 – 60.0	33.40	± 12.14
Group IV	20.0 – 65.0	35.36	± 13.37

F 2.003

P > 0.05 (insignificant)

Table (2) : Sex distribution of the studied groups.

Sex / Studied groups	Males		Females		Total	
	No.	%	No.	%	No.	%
Group I	22	88.0	3	12.0	25	100.0
Group II	17	68.0	8	32.0	25	100.0
Group III	18	72.0	7	28.0	25	100.0
Group IV	19	76.0	6	24.0	25	100.0
Total	76	76.0	24	24.0	100	100.0

$X^2 = 3.070$

P > 0.05 (insignificant)

Fig. (I) Comparison among the studied groups regarding age.

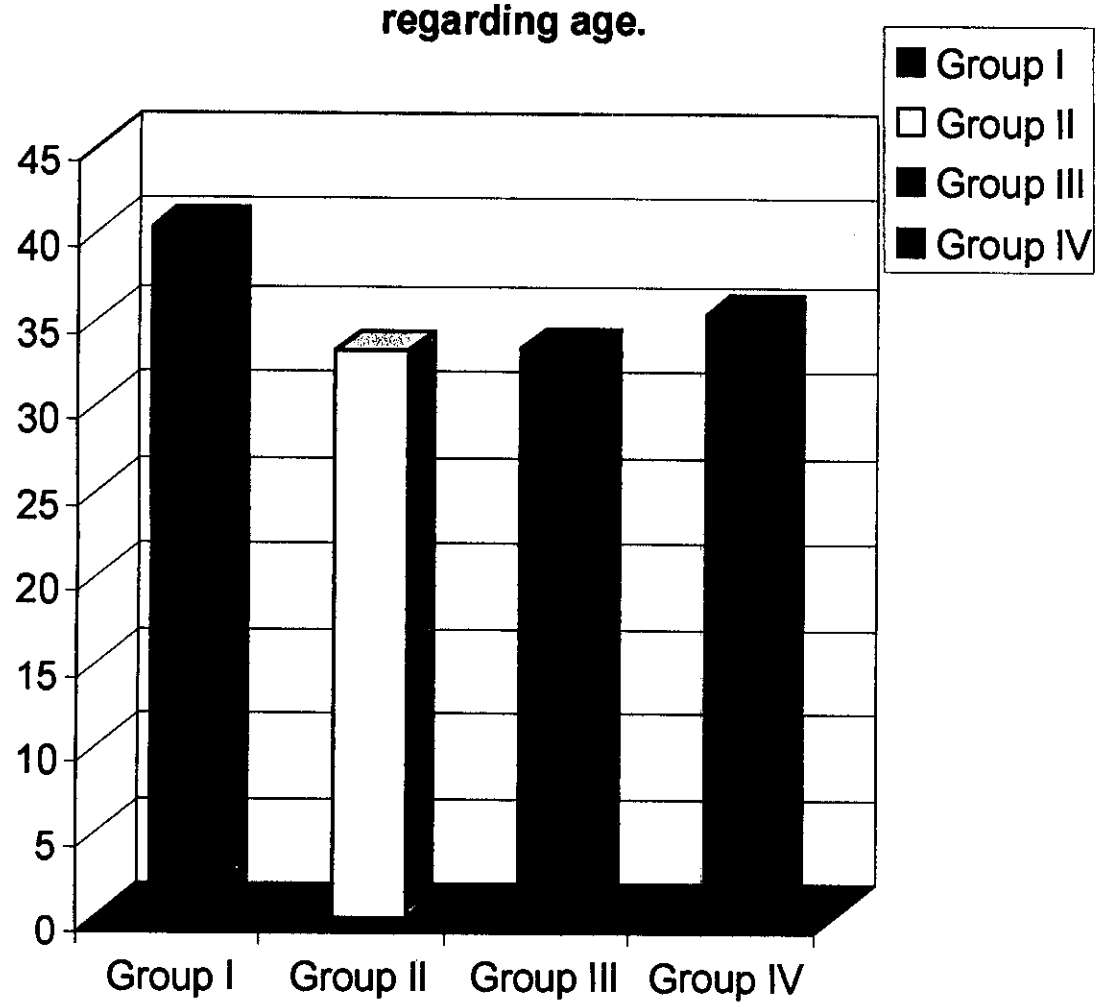
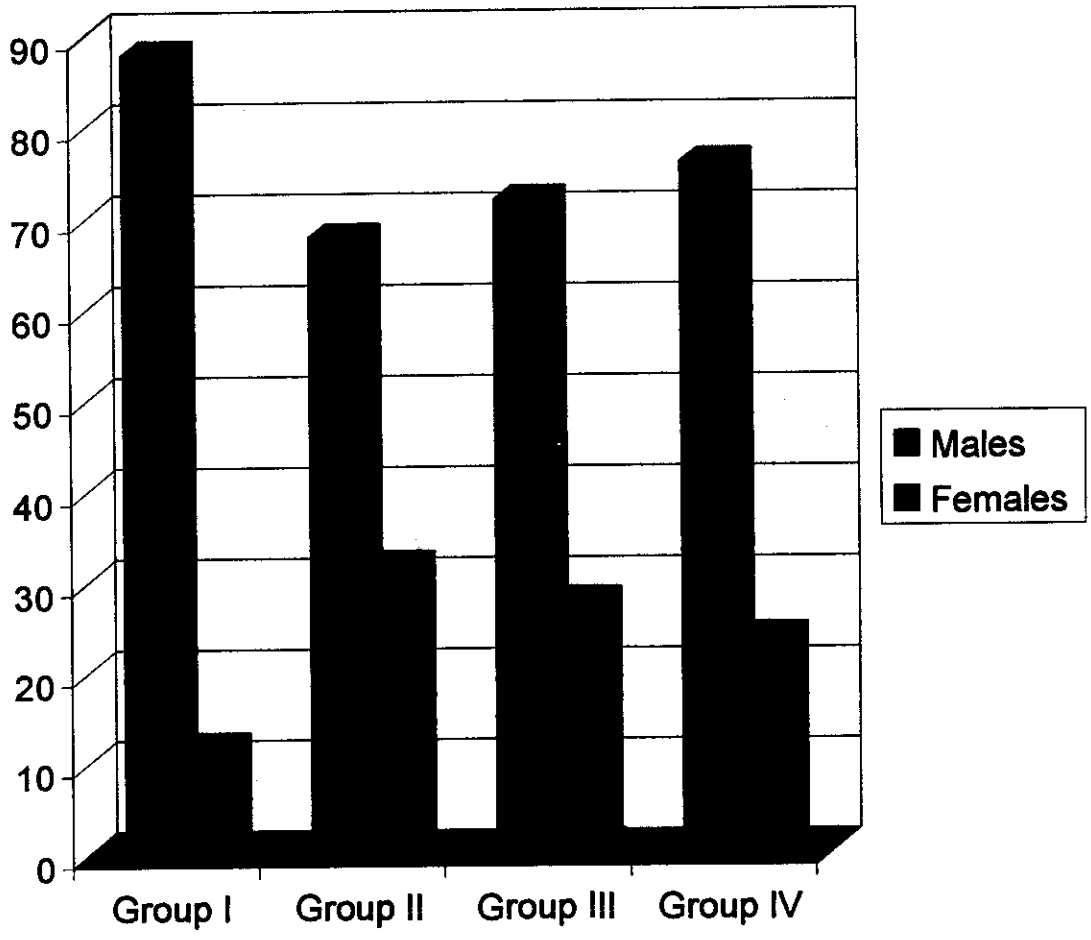


Fig. (II) : Sex distribution of the studied groups



2-Symptoms :

In group I, prolapse was the main symptom in all patients. It was associated with bleeding in 21 patients (84%) while it was associated with pruritus and discharge in only one patient (4%) and pain also in only one patient (4%) (Table 3) (Fig. III).

In group II, prolapse was also the main symptom in 23 patients (92%), bleeding in 20 patients (80%), pruritus and discharge in only one patient (4%), pain in only one patient (4%) and habitual constipation in 8 patients (32%) (Table 3) (Fig. III).

In group III, prolapse was also the main symptom in 24 patients (96%), bleeding in 22 patients (88%), pruritus and discharge in 3 patients (12%), pain in only one patient (4%) and habitual constipation in 3 patients (12%) (Table 3) (Fig. III).

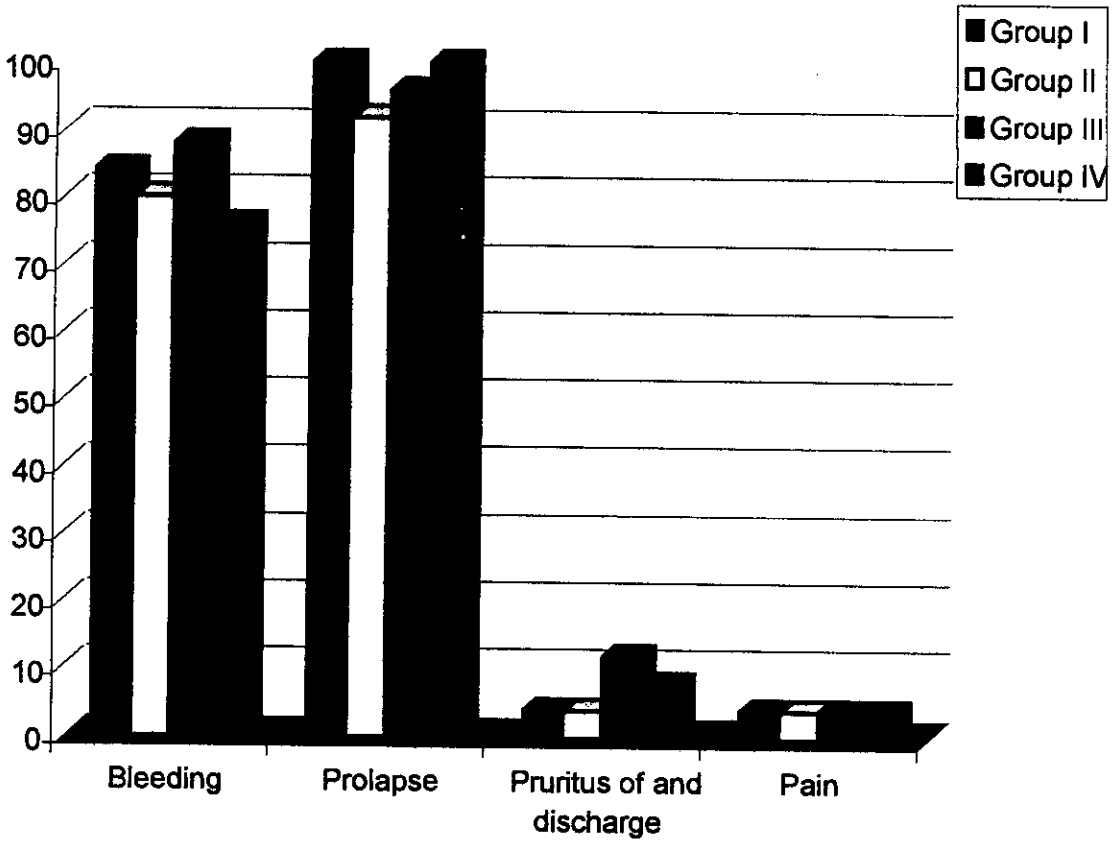
In group IV, prolapse was the main symptom in all patients, it was associated with bleeding in 19 patients (76%) while it was associated with pruritus and discharge in 2 patients (8%), pain in only one patient (4%) and Habitual constipation also in only one patient (4%) (Table 3) (Fig. III).

Among the studied groups, there was no significant difference regarding the preoperative symptoms as shown in (Table 3) (Fig. III).

Table (3) : Distribution and comparison of symptoms

Clinical presentation	Group I		Group II		Group III		Group IV	
	No.	%	No.	%	No.	%	No.	%
Bleeding	21	84.0	20	80.0	22	88.0	19	76.0
Prolapse	25	100.0	23	92.0	24	96.0	25	100.0
Pruritus and discharge	1	4.0	1	4.0	3	12.0	2	8.0
Pain	1	4.0	1	4.0	1	4.0	1	4.0
Others (defecation problems) e.g. Habitual constipation	0	0.0	8	32.0	3	12.0	1	4.0

Fig. (III) : Distribution and comparison of sym



3- Anal examination :

In group I, it was found that 15 patients (60%) had grade III haemorrhoidal disease and 10 patients (40%) had grade IV haemorrhoidal disease (Table 4).

In group II, it was found that 16 patients (64%) had grade III haemorrhoidal disease and 9 patients (36%) had grade IV haemorrhoidal disease (Table 4).

In group III, it was found that 18 patients (72%) had grade III haemorrhoidal disease and 7 patients (28%) had grade IV haemorrhoidal disease (Table 4).

In group IV, it was found that 15 patients (60%) had grade III haemorhoidal disease and 10 patients (40%) had grade IV haemorrhoidal disease (Table 4).

Table (4): Grades and distribution of haemorrhoidal disease by proctoscope

Grade and site of haemorrhoids	Group I		Group II		Group III		Group IV	
	No.	%	No.	%	No.	%	No.	%
Grade III	15	60.0	16	64.0	18	72.0	15	60.0
3o'c	15	100.0	15	93.7	10	55.6	11	73.3
7o'c	13	86.7	13	81.2	8	44.4	15	100.0
11o'c	9	60.0	7	43.7	17	94.4	6	40.0
Grade IV	10	40.0	9	36.0	7	28.0	10	40.0
3o'c	8	80.0	6	75.0	3	42.8	5	50.0
7o'c	7	70.0	7	87.5	5	71.4	7	70.0
11o'c	7	70.0	2	25.0	4	57.1	8	80.0

Grades and distribution of haemorrhoidal columns are shown in (Table 4) which shows that there is no significant difference among the studied groups.

4- Pre-operative manometery :

It was done for each patient the night before the surgery and the following results were obtained in (Table 5).

Table (5): the pre-operative anal manometric parameters in the studied groups.

Parameters	Group I (25pt)	Group II (25pt)	Group III (25pt)	Group IV (25pt)
RAP (cmH_2o)	88.65 ± 31.61	80.45 ± 33.25	90.61 ± 35.02	76.50 ± 31.51
MSP (cmH_2o)	357.90 ± 108.45	320.52 ± 80.07	344.52 ± 92.27	305.95 ± 98.34
$FACL_R$ (cm)	3.35 ± 0.76	4.00 ± 0.51	3.93 ± 0.62	3.53 ± 0.60
$FACL_s$ (cm)	4.16 ± 0.51	4.29 ± 0.40	4.24 ± 0.38	4.22 ± 0.41
VSI_R	0.57 ± 0.16	0.66 ± 0.21	0.60 ± 0.14	0.58 ± 0.21
VSI_s	0.58 ± 0.16	0.64 ± 0.20	0.70 ± 0.20	0.70 ± 0.12

Data Presented as mean ± S.D.
RAP : Resting anal pressure
MSP : Maximum squeeze pressure
$FACL_R$: Functional anal canal length (rest)
$FACL_s$: Functional anal canal length (squeeze)
VSI_R : Vector symmetry index (rest)
VSI_s : Vector symmetry index (squeeze)
$P > 0.05$ (in significant)

(Table 5) shows that there is no significant difference among the studied groups.

5- Routine investigations :

Laboratory investigations, chest X – ray and ECG were done for all patients and the following results were obtained in (Table 6).

Table (6): Routine investigations that were undertaken for all included patients

Investigation	Findings	Group I (25pt.)		Group II (25pt.)		Group III (25pt.)		Group IV (25pt.)	
		No.	%	No.	%	No.	%	No.	%
1. Laboratory : • Urine and stool	*Bilharziasis	1	4.0	1	4.0	2	8.0	1	4.0
	* Parasitic infestation	2	8.0	0	0.0	0	0.0	2	8.0
• Complete blood count.	*Anemia	1	4.0	1	4.0	1	4.0	0	0.0
	*Leucocytosis	0	0.0	0	0.0	0	0.0	0	0.0
• Liver function tests: Liver enzymes SGOT and SGPT	Raised liver enzymes	1	4.0	1	4.0	0	0.0	1	4.0
• Kideny function tests : urea and creatinine	Raised	0	0.0	0	0.0	0	0.0	0	0.0
• Blood surgar : Fasting and postprandial	Hyperglycaemia	1	4.0	0	0.0	1	4.0	0	0.0
2- Chest X-ray	chronic bronchitis	2	8.0	1	4.0	1	4.0	1	4.0
3- E.C.G.	Raised S-T segment.	1	4.0	0	0.0	2	8.0	2	8.0

(Table 6) shows that there is no significant difference among the studied groups.

6- Medical problems among the studied groups :

Associated medical diseases were recorded in all patients in (Table 7).

Table (7) : associated medical problems of all groups of patients

Associated medical problems	Group I		Group II		Group III		Group IV	
	No.	%	No.	%	No.	%	No.	%
I- Cardiovascular • Hypertension	1	4.0	0	0.0	3	12.0	0	0.0
• Ischaemia	0	0.0	0	0.0	0	0.0	0	0.0
• Arrhythmia	1	4.0	0	0.0	0	0.0	2	8.0
II-Chest problems Wheezychest	2	8.0	1	4.0	1	4.0	1	4.0
III- Diabetes Mellitus	1	4.0	0	0.0	1	4.0	0	0.0
IV- Obesity	4	16.0	4	16.0	3	12.0	3	12.0
V- Uterine prolapse	1	4.0	0	0.0	1	4.0	1	4.0

7- Operative data :

In group I, mean operative time was range 6-25 min. with a mean (11.7 ± 4.14 min), General anaesthesia was used in 20 patients (80%) and spinal anaesthesia was used in 5 patients (20%), operative complications that were recorded in this group were difficult intubation in one patient (4%), bleeding from anastomosis in one patient (4%) without any major injuries, at the end of the procedure, there is no wound in sensitive anoderm and anal verge (Table 8).

In group II, mean operative time was range 3-10 min. with a mean (5.7 ± 2.14 min.), general anaesthesia was used in 20 patients (80%) and spinal anaesthesia was used in 5 patients (20%), operative complications that were recorded in this group were delayed recovery in one patient (4%), bands grasp sensitive epithelium in one patient (4%), without any major injuries, at the end of the procedure, there is no wound in sensitive anoderm and anal verge (Table 9).

In group III, mean operative time was range 15-30 min. with a mean (20.17 ± 4.1 min.), general anaesthesia was used in 20 patients (80%) and spinal anaesthesia was used in 5 patients (20%), operative complications that were recorded in this group were difficult intubation in one patient (4%), bleeding from slipped ligature in one patient (4%), without any major injuries, at the end of the procedure, there is No wound in sensitive anoderm and anal verge (Table 10).

In group IV, mean operative time was range 20 – 35 min. with a mean (25.37 ± 5.3 min.), general anaesthesia was used in 20 patients (80%) and spinal anaesthesia was used in 5 patients (20%), operative

complications that were recorded in this group were delayed recovery in one patient (4%), bleeding from slipped ligature in one patient (4%), anal sphincter injuries in one patient (4%) and marked skin loss in one patient (4%), at the end of the procedure, there is wound in sensitive anoderm and anal verge (Table 11).

Table (8) : Details of operative data as regarding group I.

Operative data	Group I (25 pt.)
• Mean operative time	11.7 ± 4.14 min (6-25 min.).
• Type of anaesthesia - General - Spinal	 20 (80.0%) 5 (20.0%)
• Wound in sensitive anoderm and anal verge	Absent
• Intra-operative complications * anaesthetic complication e.g. –Difficult intubation -Delayed recovery.	 1 (4.0%) 0 (0.0%)
* Bleeding (from anastomosis)	1 (4.0%)
* Injuries (e.g) rectovaginal injuries - anal sphincter injuries.	0 (0.0%)

Table (9) : Details of operative data as regarding group II.

Operative data	Group II (25 pt.)
• Mean operative time	5.7 ± 2.14 min. (3-10 min.).
• Type of anaesthesia - General - Spinal	 20 (80.0%) 5 (20.0%)
• Wound in sensitive anoderm and anal verge	Absent
• Intra-operative complications * anaesthetic complication e.g. -Difficult intubation -Delayed recovery.	 0 (0.0%) 1 (4.0%)
* Bleeding	0 (0.0%)
*bands grasp sensitive epithelium	1 (4.0%)
* slipped band	0 (0.0%)
* Injuries	0 (0.0%)

Table (10) : Details of operative data as regarding group III.

Operative data	Group III (25 pt.)
• Mean operative time	20.17 ± 4.1 min. (15-30 min.).
• Type of anaesthesia - General - Spinal	 20 (80.0%) 5 (20.0%)
• Wound in sensitive anoderm and anal verge	Absent
• Intra-operative complications * anaesthetic complication e.g. -Difficult intubation - Delayed recovery.	 1 (4.0%) 0 (0.0%)
* Bleeding (slipped ligature)	1 (4.0%)
* Injuries (e.g) anal sphincter injuries .	0 (0.0%)

Table (11) : Details of operative data as regarding group IV.

Operative data	Group IV (25 pt.)
• Mean operative time	25.37 ± 5.3 min. (20-35 min.).
• Type of anaesthesia - General - Spinal	 20 (80.0%) 5 (20.0%)
• Wound in sensitive anoderm and anal verge	Present
• Intra-operative complications * anaesthetic complication e.g. -Difficult intubation - Delayed recovery.	 0 (0.0%) 1 (4.0%)
* Bleeding (slipped ligature)	1 (4.0%)
* Injuries (e.g) -anal sphincter injuries -marked skin loss	 1 (4.0%) 1 (4.0%)

8- Post-operative follow up :

Follow up was done for all patients groups from 1st week to 3 months and data was collected and gathered and the same done for post-operative complication, each group was tabulated separately and significant detail of comparison was discussed later (Table 12-19).

Table (12) : Post operative data collection of group I (follow up 1 week-3 months)

Follow up data	1 week	3 months
1. Minor wound bleeding	1 (4.0%)	0 (0.0%)
2. Pruritus	4 (16.0%)	0 (0.0%)
3. Wound discharge	1 (4.0%)	0 (0.0%)
4. Faecal impaction (requiring enema)	0 (0.0%)	0 (0.0%)
5. Tenderness on per rectum examination	-	0 (0.0%)
6. Residual skin tag	11 (44.0%)	1 (4.0%)
7.Significant difference between pre and post operative anal manometric study.	No significant difference	
8. Hospital stay (days) (mean ± S.D.)	2.12 ± 1.27	
9. Time off work (days) (mean ± S.D.)	4.60 ± 2.78	
10. Histological study of the specimen :		
- Squamous epithelium.	3 (12.0%)	
- Transitional and columnar epithelium	22 (88.0%)	
- Absence of internal sphincter fibers.	25 (100.0%)	
- Blood vessels within the specimen.	25 (100.0%)	

Table (13) : Postoperative complication of group I

(Follow up for 3 months)

Postoperative complication	Group I
Early complication :	
1. Urine retention.	0 (0.0%)
2. Rectal bleeding	1 (4.0%)
Late complication :	
2. Incontinence	
• After 1 week	
- For flatus & liquid stool.	0 (0.0%)
- For solid stool.	0 (0.0%)
• After 3 months	0 (0.0%)
3. Recurrence	
- With prolapse.	0 (0.0%)
- With bleeding.	1 (4.0%)
4. Infection.	0 (0.0%)
5. Stenosis.	0 (0.0%)
6. Fissure.	0 (0.0%)
7. Fistula.	0 (0.0%)

Table (14) : Post operative data collection of group II.

(follow up 1 week-3 months)

Follow up data	1 week	3 months
1. Minor wound bleeding	1 (4.0%)	0 (0.0%)
2. Pruritus	1 (4.0%)	0 (0.0%)
3. Wound discharge	1 (4.0%)	0 (0.0%)
4. Faecal impaction (requiring enema)	0 (0.0%)	0 (0.0%)
5. Tenderness on per rectum examination	-	1 (4.0%)
6. Residual skin tag	11 (44.0%)	6 (24.0%)
7.Significant difference between pre and post operative anal manometric study.	No significant difference	
8. Hospital stay (days) (mean ± S.D.)	1.60± 0.91	
9. Time off work (days) (mean ± S.D.)	3.12 ± 1.39	
10. Histological study of the specimen : - Squamous epithelium. - Transitional and columnar epithelium - Absence of internal sphincter fibers. - Blood vessels within the specimen.	No specimen present	

Table (15) : Postoperative complication of group II

(Follow up for 3 months)

Postoperative complication	Group I
Early complication :	
1. Urine retention.	0 (0.0%)
2. Rectal bleeding	1 (4.0%)
Late complication :	
3. Incontinence	
• After 1 week	
- For flatus & liquid stool.	0 (0.0%)
- For solid stool.	0 (0.0%)
• After 3 months	0 (0.0%)
4. Recurrence	
- With prolapse.	4 (16.0%)
- With bleeding.	4 (16.0%)
5. Infection.	0 (0.0%)
6. Stenosis.	0 (0.0%)
7. Fissure.	0 (0.0%)
8. **Fistula.**	0 (0.0%)

Table (16) : Post operative data collection of group III

(follow up 1 week-3 months)

Follow up data	1 week	3 months
1. Minor wound bleeding	4 (16.0%)	0 (0.0%)
2. Pruritus	5 (20.0%)	0 (0.0%)
3. Wound discharge	2 (8.0%)	0 (0.0%)
4. Faecal impaction (requiring enema)	0 (0.0%)	0 (0.0%)
5. Tenderness on per rectum examination	-	0 (0.0%)
6. Residual skin tag	13 (52.0%)	2 (8.0%)
7.Significant difference between pre and post operative anal manometric study.	No significant difference	
8. Hospital stay (days) (mean ± S.D.)	2.32 ± 1.75	
9. Time off work (days) (mean ± S.D.)	5.80 ± 3.23	
10. Histological study of the specimen : - Squamous epithelium. - Transitional and columnar epithelium - Absence of internal sphincter fibers. - Blood vessels within the specimen.	 4 (16.0%) 21 (84.0%) 25 (100.0%) 25 (100.0%)	

Table (17) : Postoperative complication of group III

(Follow up for 3 months)

Postoperative complication	Group I
Early complication :	
1. Urine retention.	0 (0.0%)
2. Rectal bleeding	0 (0.0%)
Late complication :	
3. Incontinence	
• After 1 week	
- For flatus & liquid stool.	0 (0.0%)
- For solid stool.	0 (0.0%)
• After 3 months	0 (0.0%)
4. Recurrence	
- With prolapse.	1 (4.0%)
- With bleeding.	0 (0.0%)
5. Infection.	1 (4.0%)
6. Stenosis.	0 (0.0%)
7. Fissure.	0 (0.0%)
8. **Fistula.**	0 (0.0%)

Table (18) : Post operative data collection of group IV

(follow up 1 week-3 months)

Follow up data	1 week	3 months
1. Minor wound bleeding	13 (52.0%)	0 (0.0%)
2. Pruritus	10 (40.0%)	0 (0.0%)
3. Wound discharge	16 (64.0%)	0 (0.0%)
4. Faecal impaction (requiring enema)	1 (4.0%)	0 (0.0%)
5. Tenderness on per rectum examination	-	1 (4.0%)
6. Residual skin tag	3 (12.0%)	0 (0.0%)
7.Significant difference between pre and post operative anal manometric study.	Significant decrease in maximum squeeze pressure and vector symmetry index at squeeze	
8. Hospital stay (days) (mean ± S.D.)	4.12 ± 2.55	
9. Time off work (days) (mean ± S.D.)	12.44 ± 4.94	
10. Histological study of the specimen : - Squamous epithelium. - Transitional and columnar epithelium - Absence of internal sphincter fibers. - Blood vessels within the specimen.	 22 (88.0%) 3 (12.0%) 25 (100.0%) 25 (100.0%)	

Table (19) : Postoperative complication of group IV

(Follow up for 3 months)

Postoperative complication	Group I
Early complication :	
1. Urine retention.	2 (8.0%)
2. Rectal bleeding	1 (4.0%)
Late complication :	
3. Incontinence	
• After 1 week	
- For flatus & liquid stool.	1 (4.0%)
- For solid stool.	0 (0.0%)
• After 3 months	0 (0.0%)
4. Recurrence	
- With prolapse.	1 (4.0%)
- With bleeding.	1 (4.0%)
5.Infection.	1 (4.0%)
6. Stenosis.	1 (4.0%)
7. Fissure.	1 (4.0%)
8. Fistula	0 (0.0%)

9-Postoperative pain measurement according to visual analoque scale : (Table 20) :

it ranges from 0 = No pain to 10 = untolerabule pain A close observation showed in 4 groups in the 1st, 3rd, 5th and 7th day post-operatively and score of pain was recorded in (Table 20).

Table (20) : Postoperative pain measurement according to visual analogue scale.

Follow up / St. gps. Score of pain	1st day		3rd day		5th day		7th day	
	No.	%	No.	%	No.	%	No.	%
Group I								
<3	25	100.0	25	100.0	25	100.0	25	100.0
3-	0	0.0	0	0.0	0	0.0	0	0.0
6-	0	0.0	0	0.0	0	0.0	0	0.0
9+	0	0.0	0	0.0	0	0.0	0	0.0
Group II								
< 3	17	68.0	19	76.0	25	100.0	25	100.0
3-	8	32.0	6	24.0	0	0.0	0	0.0
6-	0	0.0	0	0.0	0	0.0	0	0.0
9+	0	0.0	0	0.0	0	0.0	0	0.0
Group III								
< 3	15	60.0	18	72.0	22	88.0	25	100.0
3-	9	36.0	7	28.0	3	12.0	0	0.0
6-	1	4.0	0	0.0	0	0.0	0	0.0
9+	0	0.0	0	0.0	0	0.0	0	0.0
Group IV								
< 3	0	0.0	3	12.0	10	40.0	15	60.0
3-	9	36.0	12	48.0	12	48.0	9	36.0
6-	10	40.0	7	28.0	3	12.0	1	4.0
9+	6	24.0	3	12.0	0	0.0	0	0.0

VAS : Visual analogue scale of pain : it ranges

from 0 = No pain

to 10 = Untolerabule pain

10- Post-operative analgesia:

In group I, oral analgesia needed in 1st post-operative week in 15 patients (60%), while injection analgesia needed in 2 patients (8%), and 8 patients (32%) needed no analgesia, while No patient needed narcotic (Table 21) (Fig. IV).

In group II, oral analgesia needed in 1st post-operative week in 14 patients (56%), while injection analgesia needed in 6 patients (24%), and 5 patients (20%) needed no analgesia, while No patient needed narcotic (Table 21) (Fig. IV).

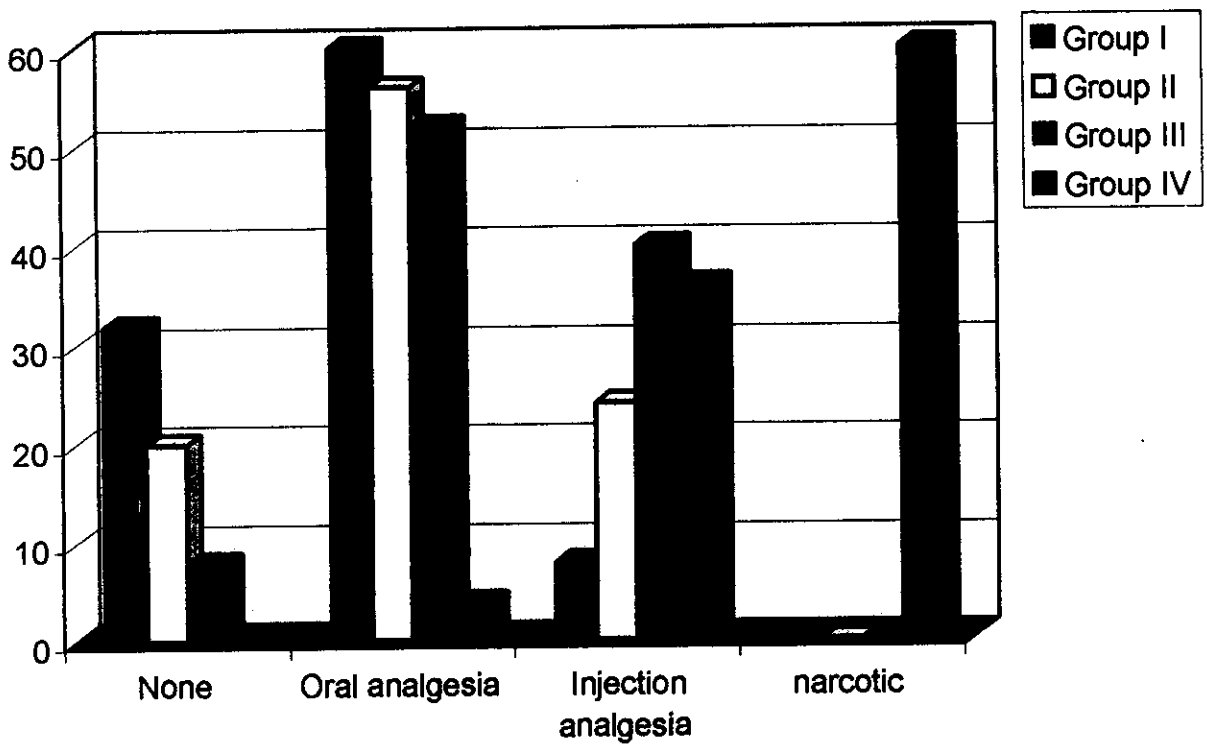
In group III, oral analgesia needed in 1st post-operative week in 13 patients (52%), while injection analgesia needed in 10 patients (40%), and 2 patients (8%) needed no analgesia, while No patient needed narcotic (Table 21) (Fig. IV).

In group IV, oral analgesia needed in 1st post-operative week in 1 patients (4%), while injection analgesia needed in 9 patients (36%), and 15 patients (60%) need narcotic, while no patient needed no analgesia (Table 21) (Fig. IV).

Table (21) : Comparison of administration of analgesia in the 1st postoperative week.

Analgesic	Group I n = 25pt.	Group II n = 25pt.	Group III n = 25 pt.	Group IV n = 25pt.
None	8 (32.0%)	5 (20.0%)	2 (8.0%)	0 (0.0%)
Oral analgesia (tablets)	15 (60.0%)	14.(56.0%)	13 (52.0%)	1 (4.0%)
Injection analgesia (NSAID)	2 (8.0%)	6 (24.0%)	10 (40.0%)	9 (36.0%)
Narcotic	0 (0.0%)	0 (0.0%)	0 (0.0%)	15 (60.0%)

Fig. (IV) :Comparison of adminisration of analgesia in the 1st post-operative week.



11- Hospital stay and time off work :

In group I, mean hospital stay was 2.12 ± 1.27 days with significant difference as compared with group IV where mean hospital stay was 4.12 ± 2.55 days. as regard time off work, it was 4.60 ± 2.78 days with highly significant difference as compared with group IV where mean time off work was 12.44 ± 4.94 (Table 22, 23) (Fig. V).

In group II, mean hospital stay was 1.60 ± 0.91 days with significant difference as compared with group IV where mean hospital stay was 4.12 ± 2.55 days. as regard time off work, it was 3.12 ± 1.39 days with highly significant difference as compared with group IV where mean time off work was 12.44 ± 4.94 (Table 22, 23) (Fig. V).

In group III, mean hospital stay was 2.32 ± 1.75 days with significant difference as compared with group IV where mean hospital stay was 4.12 ± 2.55 days. as regard time off work, it was 5.80 ± 3.23 days with highly significant difference as compared with group IV where mean time off work was 12.44 ± 4.94 (Table 22, 23) (Fig. V).

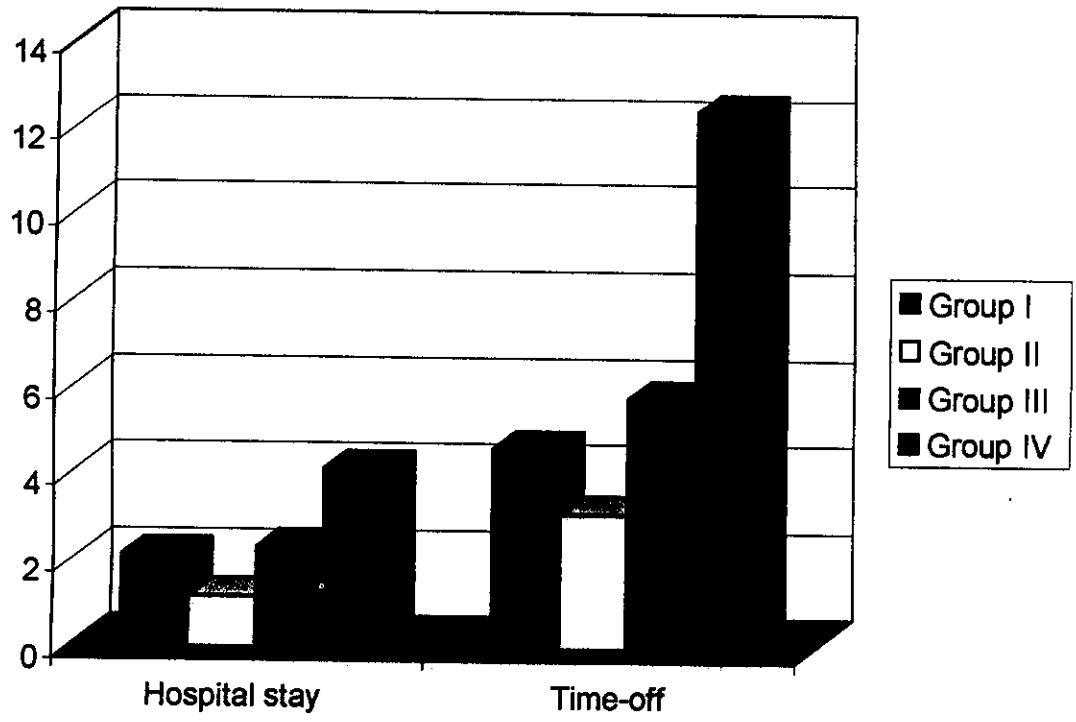
Table (22): Comparison among the studied groups regarding hospital stay and time-off work [data presented as mean ± S.D.]

St. gps	Group I	Group II	Group III	Group IV	F	P
	$\overline{X}$ ±S.D.	$\overline{X}$ ±S.D.	$\overline{X}$ ±S.D.	$\overline{X}$ ±S.D.		
Hospital stay	2.12 ± 1.27	1.60 ± 0.91	2.32 ± 1.75	4.12 ± 2.55	9.988	<0.05 significant
Time off work	4.60 ± 2.78	3.12 ± 1.39	5.80 ± 3.23	12.44 ± 4.94	38.030	< 0.01 highly significant

Table (23) : Comparison of hospital stay and time off work amoung the studied groups.

St. gps. / Parameters	Group I n = 25pt.		Group II n = 25pt.		Group III n = 25pt.		Group IV n = 25pt.	
	No.	%	No.	%	No.	%	No.	%
Hospital stay								
<3 days	20	80.0	23	92.0	17	68.0	8	32.0
3- days	4	16.0	2	8.0	6	24.0	10	40.0
6- days	1	4.0	0	0.0	2	8.0	5	20.0
9+ days	0	0.0	0	0.0	0	0.0	2	8.0
Time off work								
< 7 days	20	80.0	23	92.0	15	60.0	0	0.0
7- days	5	20.0	2	8.0	10	40.0	16	64.0
14+ days	0	0.0	0	0.0	0	0.0	9	36.0

Fig. (V) : Comparison among the studied groups regarding hospital stay and time-off work.



12- Post-operative manometery :

It was done 3 months after surgery and the following results were obtained and recorded in (table 24), there is no significant difference regarding the pre-operative mean parameter and post-operative mean parameter except in group IV where there was a significant difference in only MSP and VSIs (Table 24).

Table (24): Post-operative anal manometric parameters in the studied groups (3 months after surgery).

Parameters	Group I (25pt)	Group II (25pt)	Group III (25pt)	Group IV (25pt)
RAP (cmH_2o)	86.20 ± 22.40	80.11 ± 30.25	88.61 ± 30.02	75.40 ± 30.51
MSP (cmH_2o)	361.55 ± 91.73	318.50 ± 75.07	290.52 ± 90.27	239.05 ± 90.51*
$FACL_R$ (cm)	3.47 ± 0.68	4.01 ± 0.55	3.81 ± 0.60	3.70 ± 0.62
$FACL_s$ (cm)	3.87 ± 0.74	4.10 ± 0.30	4.11 ± 0.28	4.23 ± 0.47
VSI_R	0.51 ± 0.16	0.59 ± 0.12	0.50 ± 0.11	0.51 ± 0.15
VSI_s	0.55 ± 0.17	0.60 ± 0.18	0.69 ± 0.22	0.52 ± 0.20*

Data Presented as mean ± S.D.

RAP : Resting anal pressure

MSP : Maximum squeeze pressure

$FACL_R$: Functional anal canal length (rest)

$FACL_s$: Functional anal canal length (squeeze)

VSI_R : Vector symmetry index (rest)

VSI_s : Vector symmetry index (squeeze)

* $P < 0.05$ (Significant)

13- Histological study of the specimen :

In group I, Existence of transitional and columnar epithelium was found in 22 patients (88%). But squamous epithelium was found in 3 patients (12%). All patients were shown absence of the fibers of the internal sphincter and existence of the blood vessels within the specimen (Table 25) (Fig. VI).

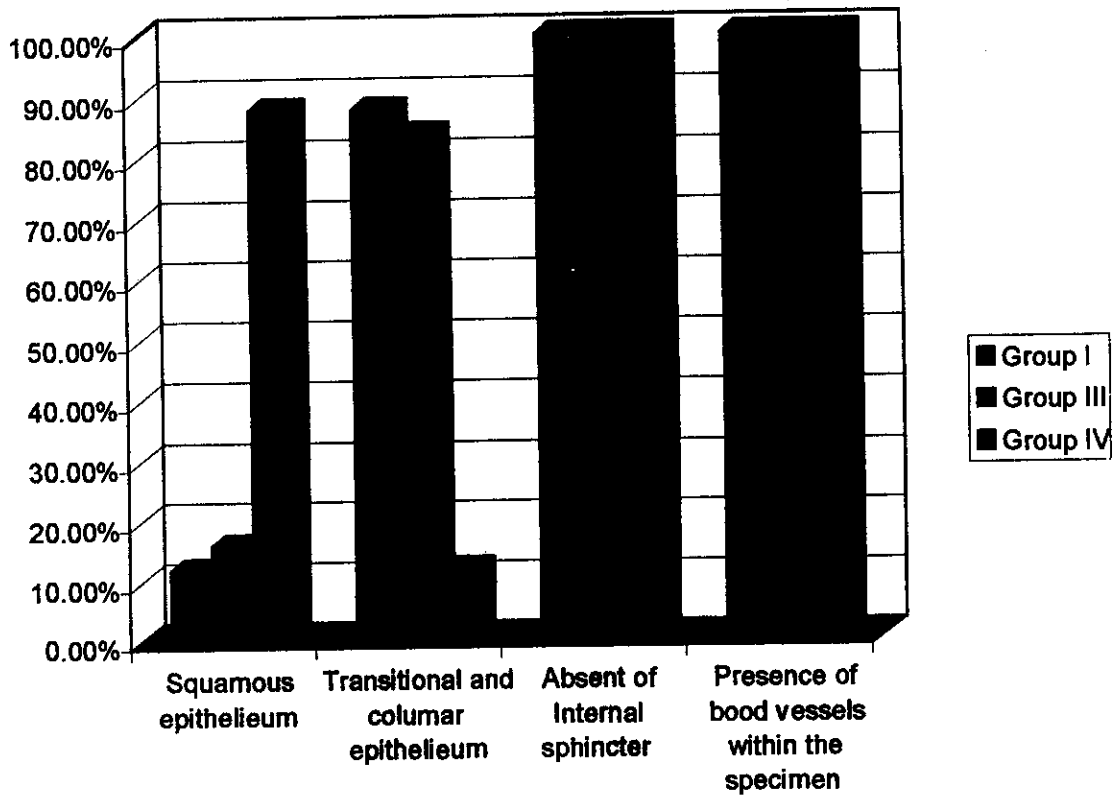
In group III, Existence of transitional and columnar epithelium was found in 21 patients (84%). But squamous epithelium was found in 4 patients (16%). All patients were shown absence of the fibers of the internal sphincter and existence of the blood vessels within the specimen (Table 25) (Fig. VI).

In group III, Existence of transitional and columnar epithelium was found in 3 patients (12%). But squamous epithelium was found in 22 patients (88%). All patients were shown absence of the fibers of the internal sphincter and existence of the blood vessels within the specimen (Table 25) (Fig. VI).

Table (25): Comparison of the results of histological study among group I, III and IV.

Histological study	Group I		Group III		Group IV	
	No.	%	No.	%	No.	%
Existence of squamous epithelium	3	(12.0%)	4	(16.0%)	22	(88.0%)
Existence of transitional and colunar epithelium	22	(88.0%)	21	(84.0%)	3	(12.0%)
Absence of the fibers of the internal sphincter	25	(100.0%)	25	(100.0%)	25	(100.0%)
Existence of the blood vessels within the specimen	25	(100.0%)	25	(100.0%)	25	(100.0%)

Fig. (VI) : Comparison of the results of histologic study among group I, III and IV



14- Wound condition during follow up :

- Follow up shows that there is a significant difference regarding incidence of minor wound bleeding and wound discharge tending to be higher in group IV than other 1st three groups, during 1st week, while there was no significant difference was found after three months follow up. The same significant difference was found in the 1st week follow up regarding the pruritus which occurred more in group IV while longer follow up shows no difference (Table 26).
- Only one patient (4%) in group IV complaining of faecal impaction (requiring enema) in the 1st week, (Table 26).
- Digital per-rectal examination was performed during the follow up and tenderness was observed after three months, there was no significant difference (Table 26).
- Residual skin tags was observed higher in 1st three groups than group IV during 1st week while there was no significant difference after 3 months (Table 26).
- Wound healing was observed during follow up after three months, there was no significant difference (Table 26).

Table (26) : Wound condition during follow up (1 week- 3 months) among the studied groups.

Parameters \ St. gp.	1 week								3 Months							
	I		II		III		IV		I		II		III		IV	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Minor wound bleeding	1	4.0	1	4.0	4	16.0	13	52.0	0	0.0	0	0.0	0	0.0	0	0.0
Pruritus	4	16.0	1	4.0	5	20.0	10	40.0	0	0.0	0	0.0	0	0.0	0	0.0
Wound discharge	1	4.0	1	4.0	2	8.0	16	64.0	0	0.0	0	0.0	0	0.0	0	0.0
Fecal impaction (requiring enema)	0	0.0	0	0.0	0	0.0	1	4.0	0	0.0	0	0.0	0	0.0	0	0.0
Tenderness on per rectal examination	-	-	-	-	-	-	-	-	0	0.0	1	4.0	0	0.0	1	4.0
Residual skin tags	11	44.0	11	44.0	13	52.0	3	12.0	1	4.0	6	24	2	8.0	0	0.0
Wound fully healed	0	0.0	0	0.0	0	0.0	0	0.0	25	100.0	25	100.0	25	100.0	25	100.0

15- Comparison of pre-operative and post-operative anal manometeric parameters :

Anal manometery was done for each patient pre-operatively and 3 months post-operatively. A significant difference between pre-operative MSP mean (305.95 ± 98.34 cm H_2o) and post-operative MSP mean (239.05 ± 90.51 cm H_2o) also a significant difference between pre-operative VSI_S mean (0.70 ± 0.12) and post-operative VSI_S mean (0.52 ± 0.20). But there was no significant difference regarding pre-operative RAP, $FACL_R$, $FACl_S$ and VSI_R and their post-operative finding (Table 27).

Table (27): Comparison between pre-and post-operative anal manometric study as regard [Group IV]

Parameters	Group IV	
	Pre-operative	Postoperative
RAP (cmH_2o)	76.50 ± 31.51	75.40 ± 30.51
MSP (cmH_2o)	305.95 ± 98.34	239.05 ± 90.51*
$FACL_R$ (cm)	3.53 ± 0.60	3.70 ± 0.62
$FACL_s$ (cm)	4.22 ± 0.41	4.23 ± 0.47
VSI_R	0.58 ± 0.21	0.51 ± 0.15
VSI_s	0.70 ± 0.12	0.52 ± 0.20*

Data Presented as mean ± S.D.
RAP : Resting anal pressure
MSP : Maximum squeeze pressure
$FACL_R$: Functional anal canal length (rest)
$FACL_s$: Functional anal canal length (squeeze)
VSI_R : Vector symmetry index (rest)
VSI_s : Vector symmetry index (squeeze)
* $P < 0.05$ (significant)

16- Post-operative complication :

In group I, only one patient (4%) shows immediate rectal bleeding and also only one patient (4%) develops recurrence with bleeding (Table 28). In group II, significant higher incidence of Recurrence is observed with prolapse in 4 patients (16%) and with bleeding in 4 patients also (16%) but only one patient (4%) develops immediate rectal bleeding (Table 28).

In group III, only one patient (4%) shows recurrence with prolapse and also only one patient (4%) develops infection. (Table 28).

In group IV, two patients (8%) suffer from urine retention, one patient (4%) shows immediate rectal bleeding, one patient (4%) shows incontinence for flatus and liquid stool, two patient (8%) with recurrence, one patient (4%) shows infection, one patient shows stenosis and also one patient develops fissure (Table 28).

Table (28) : Comparison of post-operative complication among each group.

Post-operative complication	Group I n = 25pt.	Group II n = 25pt.	Group III n = 25pt.	Group IV n = 25pt.
Early complication				
• Urine retention	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (8.0%)
• Rectal bleeding				
- Immediate	1 (4.0%)	1(4.0%)	0 (0.0%)	1 (4.0%)
- Delayed				
Late complications				
• Incontinence				
*after 1 week				
- for flatus and liquid stool	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (4.0%)
- for solid stool	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
*after 3 months	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
• Recurrence				
*after 3 months				
- with prolapse	0 (0.0%)	4 (16.0%)	1 (4.0%)	1 (4.0%)
- with bleeding	1 (4.0%)	4 (16.0%)	0 (0.0%)	1 (4.0%)
• Infections	0 (0.0%)	0 (0.0%)	1 (4.0%)	1 (4.0%)
• Stenosis	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (4.0%)
• Fissure	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (4.0%)
• Fistula	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)