Internal Anal Sphincter Repair

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Introduction

* For many years, internal sphincter repair was deemed inappropriate technique due to a belief of sure recurrence though perfection of the technique this is due to the unique nature of the internal sphincter muscle fibers added to the inappropriate detection of the site and extent of the defect in the internal sphincter depending only on clinical examination as the only available tool. ***Leroi et al (1997), Morgan et al 1997***

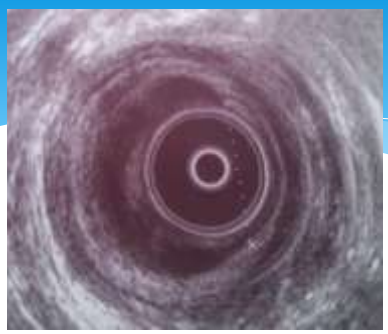
* More recent, with the advance of endoanal ultrasound technology, few surgeons regained the interest to repair the internal sphincter defects using non absorbable stitches with respectable results. ***Abou-Zeid 2000, Demirbas et al 2003***

* ***We aimed*** from this study to re-evaluate the technique and results of repairing a selected group with IAS injuries, hoping for accepted and permanent success rates that can encourage us to continue.

Patients & Method

* Prospective controlled study, which was completed upon 17 patients recruited from Ain Shams University Hospitals, Cairo, Egypt from August 2013 till February 2015.
* Including patients with isolated internal anal sphincter injury.
* Excluding combined internal-external sphincter injuries, multiple internal sphincter injuries (patchy internal sphincter) and internal sphincter injury with other anaorectal pathology (e.g. fistula, piles, ulcerative colitis and rectal prolapse). Also patients with a single internal sphincter injury exceeding 50% of the circumference of the anal canal were excluded from the study.

- In our study, we performed overlap internal sphincter repair for 21 cases over 19 months with follow up for 12 months. Only 17 cases completed the study.
- All patients were subjected to endoanal ultrasonography for detecting site, size and number of injuries, and also to exclude the presence of external anal sphincter defect.
- According to the size of defect (by endoanal ultrasound) we classified the patients into 3 groups;
  - ✓ Group A: size of defect ≤ ¼ of the internal sphincter circumference,
  - ✓ group B: size of defect ≤ 1/3 of the circumference but more than >¼ of the circumference, and
  - ✓ group C: size of defect ≤ ½ of the circumference but more than 1/3.



Endoanal ultrasound finding consistent with defect < 50% (group C) of the internal sphincter circumference

- Anal manometric studies for the whole 21 patients stressing on the resting anal pressure and the squeeze pressure were performed at our outpatient clinic.

Operative Tips

* Our technique depend on adequate dissection of the healthy edges of internal sphincter followed by overlap repair (transverse mattress 4/zero prolene).
* In large defects > 1/3 circumference limited plication of the external sphincter exposed to the injured internal sphincter had been performed using nonabsorbable stitches.
* All knots facing the intersphincteric space.
* Excess skin and anoderm were trimmed and the residual was stitched using Vicryl absorbable material (3/zero) in a tri- armed star manner, with spacing about 5 mm between stitches.

Overlapping of both healthy ends of the internal sphincter

After closure of the wound (Tri-armed Star appearance of the skin closure)

Results

Mean Wexner score preoperatively , at the end of the 2^{nd} , 6^{th} and 12^{th} months postoperatively

	Preoperative	2 months	6 months	12 months
Mean	15.12	5.88	7.12	7.24

Relation between the preoperative resting anal pressure (RAP) and the failure rate

Preoperative RAP	Total number	Failed cases (%)
<25mmhg	11	3 (27%)
>25mmhg	6	2 (33%)

Relation between the size of the defect and the failure rate

Size of the defect	Total number (%)	Failed cases (%)
≤ 1/3	9 (52.9%)	1 (11%)
> 1/3 - ≤1/2	8 (47%)	4 (50%)

Relation between the age and failure rate

Age	Total number (%)	Failed cases (%)
≤ 40 years	10 (58.8%)	3 (30%)
> 40 years	7 (41.1%)	2 (28.6%)

Discussion

* After one year of follow-up of 17 patients with attempted internal anal sphincter repair following iatrogenic internal anal sphincter injury, we noticed that with a defect size less or equal to 1/3 of the sphincter circumference the failure rate was 11% which rose significantly to 50% with a size of defect more than 1/3 and up to ½ of the sphincter circumference.
* So we concluded that the failure rate is directly proportionate with the size of the defect.

* In our study, the preoperative resting anal pressure was not a prognostic factor for failure, so we believe that preoperative resting anal pressure is not a significant factor to role the prognosis.
* Using nonabsorbable monofilament (prolene 4/zero) and keeping the knots facing the intersphincteric plane not the mucosa, in our opinion decreases the incidence of infection and protrusion of the stitches into the anal canal, moreover proper spacing between stitches prevents the occurrence of sphincter ischemia and dehiscence.

* ***Farag 2012*** published his book (Integrated Coloproctology a New Theory of Anorectal Physiology) where he mentioned that the anal canal resistance is directly proportionate to the anal canal length and inversely proportionate to the anal canal diameter (resistance equation).
* From this equation we had a key to improve our technique which is to regain a long tube of sphincter around the anal canal with accepted narrowing of the internal diameter of this tube to leave a continuous average high pressure inside this tube and permit an adequate sampling (proper sensation of the stools by mucosa of the upper anal canal) via the narrowing, elongation and overlap flap of the internal sphincter**.**

Conclusion

We think that internal sphincter repair with proper selection criteria (isolated defect, size of defect less than ½ of the circumference and with well experienced surgeons) worth the trial of repair with hopeful results and this could be a little pit attributed to the perception of the flow and resistance equations in the field of anal canal pathophysiology .


THANK YOU