Comparison of Milligan Morgan Hemorrhoidectomy and Stapled Hemorrhoidectomy in Recent Years For Patients With Grade III And IV Hemorrhoids: A Meta-Analysis

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List of Abbreviations

Abb.	Full term
CI	Confidence intervals
FH	Ferguson hemorrhoidectomy
MM	Milligan-Morgan technique
MMH	Milligan-Morgan hemorrhoidectomy
MMP	Matrix metalloproteinases
MRV	Middle rectal veins
OR	Odds ratios
PPH	Procedure for prolapse and hemorrhoids
RCTs	Randomized controlled trials
SRV	Superior rectal veins
ST	Stapled hemor-rhoidectomy

INTRODUCTION

The word 'hemorrhoid' is derived from the Greek haimorrhoos, meaning flowing of blood (haima equals blood, rhoos equals flowing). The word 'pile' comes from the Latin 'pila' meaning ball or pill. The cause of hemorrhoidal disease is unknown. The prevalence of hemorrhoidal disease varies from 4% of the general population to 36.4% in general practice. The annual rate of office visits for hemorrhoidal disease is 12 for every 1000 patients in the United States, its prevalence is similar between the sexes, and increases with age until the seventh decade ***(Johanson and Sonnenberg, 1991).***

Numerous theories, concerning the pathogenesis of hemorrhoids have been propose but the exact mechanism remains elusive. Constipation and straining were once accepted as the major cause of hemorrhoidal disease but this is considered to be a gross oversimplification. Straining excessively to pass a bowel movement is a common practice described by patients with hemorrhoidal disease ***(Loder et al., 1994).***

Clinically, classification of hemorrhoids is described as four distinct 'degrees' depending on the extent of prolapse. First-degree hemorrhoids are anal cushions that do not descend below the dentate line on straining, but may develop symptoms of bleeding. Second-degree hemorrhoids are when anal cushions protrude below the dentate line on straining, but retract automatically when the straining ceases. Third-degree

hemorrhoids are when the anal cushions descend below the anal verge on straining or defecation and remain prolapsed until they are digitally replaced. Fourth-degree hemorrhoids is a term used by some to describe anal cushions permanently outside the anal verge ***(Dozois and Pemberton, 2006).***

Hemorrhoidal disease can give rise to varying degrees of bleeding, anal swelling, pain, discomfort, discharge, and pruritus. Bleeding is the most common presenting complaint. Hemorrhoids in themselves rarely cause anal pain unless there is thrombosis. Diagnosis of internal hemorrhoids is usually based on symptoms, which include painless bleeding or prolapse. Bleeding is described as bright red spotting on toilet paper or dripping in the toilet bowl and normally occurs at the end of defecation and is separate from the stool ***(Dozois and Pemberton, 2006).***

The treatment methods for hemorrhoids include medical therapies, nonsurgical office-based treatments and surgery. Mild hemorrhoids can be managed with medical treatment, including dietary modifications with adequate fluid and fiber intake, while limiting long periods of time on the toile. According to the 2018 American Society of Colon and Rectal Surgeons Clinical Practice Guidelines for the Management of Hemorrhoids ***(ASCRS, 2018),*** surgery is reserved for patients who fail nonoperative treatment and those who have grade III or IV hemorrhoids ***(Davis et al., 2018).***

Aim of the Work

The aim of this study is to compere between Milligan-Morgan hemorrhoidectomy and Stapled hemorrhoidectomy as regards postoperative anal stenosis and fecal incontinence in recent years for treatment grade III and IV hemorrhoids using a meta-analysis approach.

REVIEW OF LITERATURE

Applied Anatomy of Anal Canal and Hemorrhoids:

The anatomical anal canal extends from the level of the valves of Morgagni (dentate line) to the anal margin. For surgical purposes, the anal canal may be regarded as that portion of the terminal intestine which extends from the level where the rectum passes through the pelvic visceral aperture- the anorectal ring-to the the anal margin. This concept of the anal canal is more apposite for surgical purposes and as the anorectal ring is above the valves of Morgagni, the surgical anal canal is longer than its anatomical counterpart ***(Milligan et al., 1934)*** (Fig. 1).

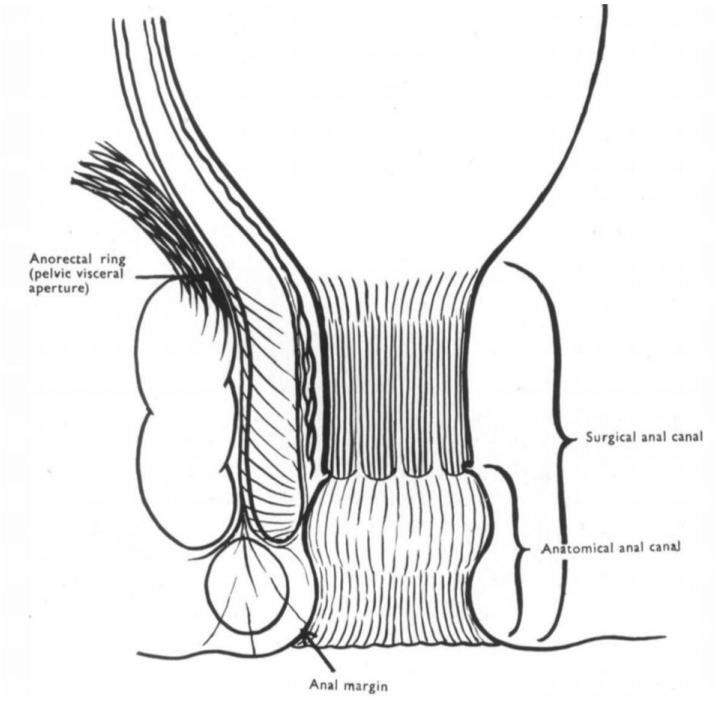

Figure (1): The surgical and anatomical anal canals ***(Milligan et al., 1934)***.

Hemorrhoids are normal structures of the human body. Internal hemorrhoids arise from the internal hemorrhoidal plexus, while external hemorrhoids arise from the external plexus. The anatomical boundary that divides the internal from the external hemorrhoidal plexus is the dentate line. The normal internal hemorrhoidal plexus consists of 3 soft engorgements, referred to as anal cushions or "hemorrhoids" ***(Mott et al., 2018).***

The internal hemorrhoidal plexus is placed submucosally above the dentate line and below the anorectal ring. It extends from the upper border of the anatomical anal canal to the upper border of the surgical anal canal. It is located, therefore, outside the anatomical anal canal. It is covered by transitional columnar epithelium and originates embryologically by the cloacal part of the anal canal, which contains both ectodermal and endodermal elements. This epithelium is approximately 1 cm long and, as anatomically authentic rectal epithelium, it secretes mucus and is not innervated by visceral pain fibers ***(Sun and Migaly, 2016).***

The external hemorrhoid is formed by that lining below the dentate line. Since external hemorrhoid is covered by anoderm and perianal skin, it is somatically innervated and sensitive to pain stimulus ***(Lohsiriwat, 2012).***

Typically, there are three major cushions located in right anterior, right posterior, and left lateral aspect of the anal canal.

However, there could be a various number of minor anal cushions lying between them ***(Lohsiriwat, 2012)*** (Fig. 2).

In general, hemorrhoids are referred to abnormally congested anal cushions and/or downward displacement of anal cushions. The anal cushions of patients with hemorrhoids show significant pathologic changes including markedly dilated vascular channels, venous thrombosis, and fragmented subepithelial smooth muscle ***(Lohsiriwat, 2012)*** (Fig. 3)

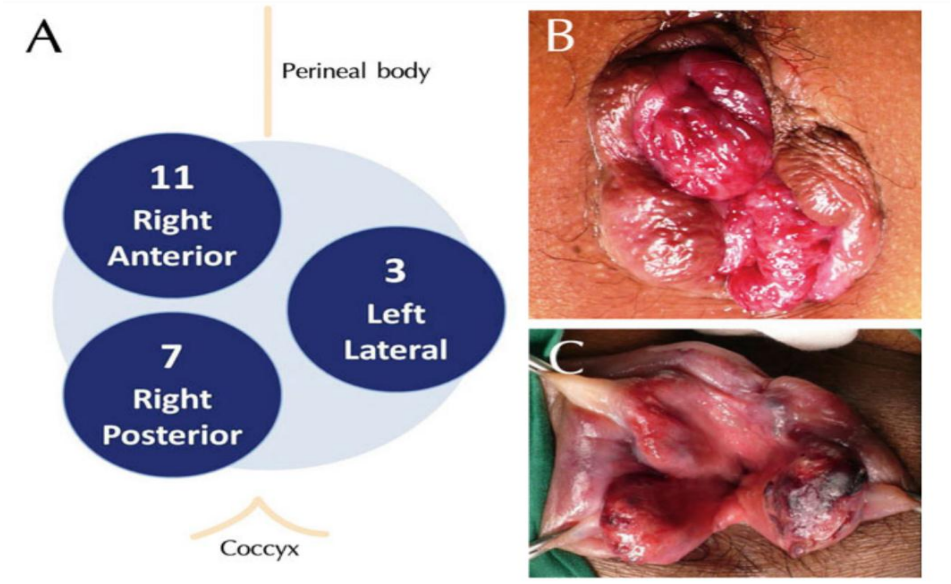

Figure (2): Diagram of common sites of major anal cushions (a) and internal hemorrhoids; (b) and (c) two examples of hemorrhoidal cushions locations ***(Lohsiriwat, 2015).***

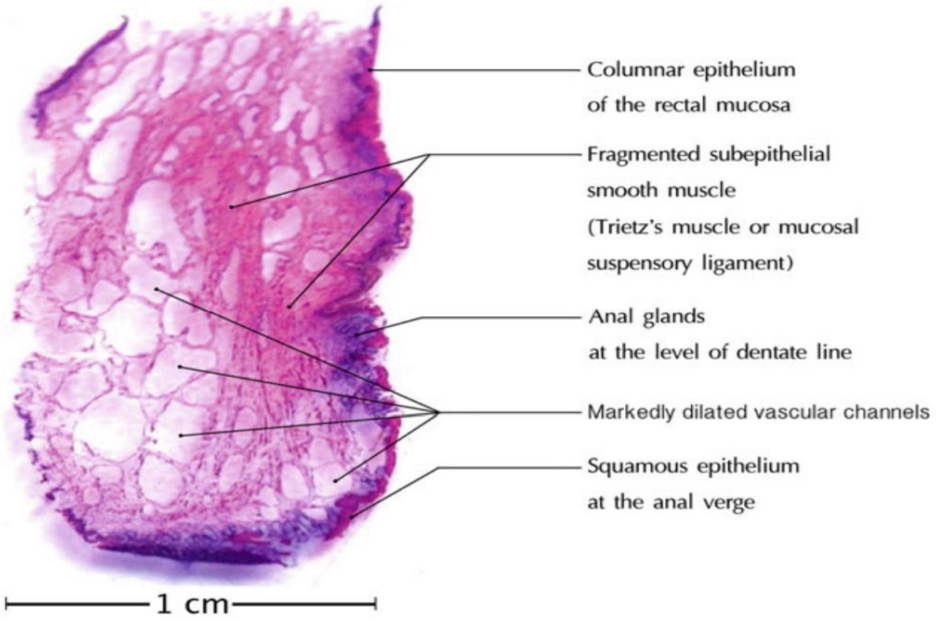

Figure (3): Histopathologic changes in advanced hemorrhoids ***(Lohsiriwat, 2015).***

Three main anal cushions are easily recognized in the usual surgical anal canal. Despite being tissues that are predominantly vascular in origin, anal cushions also contain a significant non-vascular portion. The internal hemorrhoidal plexus consists of arterioles, venules and direct communications between them (arteriolar-venular functional anastomoses). The presence of vessels inside cushions contributes to the scarlet color of the surgical anal canal. The internal hemorrhoidal plexus receives blood from the superior (SRA) and the middle (MRA) rectal arteries. In the majority of cases these arteries form a plexus just behind the rectum. This plexus, absolutely distinct from the internal hemorrhoidal plexus, commonly provides 3 principal terminal branches,