"A STUDY OF POST OPERATIVE OUTCOMES OF LASER HEMORRHOIDOPLASTY VS CONVENTIONAL OPEN HEMORRHOIDECTOMY: ONE YEAR COMPARATIVE CLINICAL STUDY"

BY

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LIST OF ABBREVIATIONS.

HeLP	Laser Haemorrhoid Procedure
DGHAL/THD	Doppler-guided hemorrhoidal artery ligation
FGHAL+LH	Finger-guided hemorrhoidal artery ligation
ANOVA	Analysis of variance
LHP	Laser Hemorrhoidoplasty
SH	Stapler Haemorrhoidopexy
LH	Laser Hemorrhoidoplasty
ET	Endothelin
M	muscle mass
C	connective tissue
VAS	Visual Analog Scale
Ch-SQ	Chi-square test

ABSTRACT

Background

Haemorrhoids refers to symptoms arising from anal cushion, these vascular cushions are believed to help in stool retention by adding bulk to the anal canal. Haemorrhoids are located in three primary positions: Left lateral, right front ,right back. Conditions that increase intra-abdominal pressure, such as pregnancy and exercise, or those that weaken the supporting tissue, predispose to symptomatic haemorrhoids. This study provides in detail about the post operative outcomes of laser haemorrhoidoplasty in comparison with open haemorrhoidectomy, aiming to enhance the further understanding and management of patients with haemorrhoids

Material and methods

This is an observational prospective comparative clinical study involving 60 patients admitted to our tertiary setup over a period of one year. The patients were divided randomly into two groups based on the type of surgery(laser and open) by envelope method .The measurements of post operative pain, bleeding, return to work, mobility and duration of surgery. The statistical analysis was determined using independent t test Normality of variable is checked by Shapiro Wilk test and QQ plot. Two sample t test/Mann Whitney U test can be used to compare means/distributions of variables between the groups. P-value less than or equal to 0.05 indicates statistical significance.

Results

Our study shows that association between type of Surgery and bleeding was found to be significant at 12 Hrs and 24 hrs ($P<0.05$) & non-significant at 48 Hrs ($P>0.05$). Mean Pain score at 12 Hour & 24 Hour between two different Type of Surgery were calculated . In the case of 12HR, the mean value 2.13 for Laser Type of Surgery was significantly lower than the mean value 4.27 for Open Type of Surgery ($P<0.05$).At 24, the mean value 1.13 for Laser Type of Surgery was significantly lower than the mean value 2.80 for Open. In our study the duration of surgery, the

mean value 16.23 for Laser Type of Surgery was significantly lower than the mean value 34.07 for Open Type of Surgery. (P<0.05).). Our study shows that there was significant difference in the mean Return of Work value between two groups(P<0.05). At 12 ,24 hours patients who had undergone laser hemorrhoidoplasty had better ambulation than open haemorrhoidectomy procedure and the p-value was found to be statistically significant(<0.05).The mean value 5.67 for Laser Type of Surgery was significantly lower than the mean value 14.87 for Open Type of Surgery. (P<0.05). Chi square test for association between two variables was applied, which shows that all association between Type of Surgery and Durations was found to be significant p-value (<0.05)

Conclusion

The study indicates that there is no significant difference in the age and sex distribution between patients undergoing laser and open surgeries, suggesting that demographic factors do not influence the choice of surgical method. However, the clinical outcomes highlight significant differences favouring laser surgery. Additionally, laser surgery patients reported significantly lower pain scores at 12, 24 and 48 hours post-operation, which can contribute to overall patient satisfaction and comfort. Patients who underwent laser surgery experienced significantly lower rates of post-operative bleeding within the first 48 hours. This indicates that laser surgery is less invasive and associated with fewer immediate complications. This suggests that laser surgery allows for a quicker return to normal activities and reduces the burden on healthcare facilities. The time to return to work was also significantly shorter for laser surgery patients, highlighting the economic and social benefits of this surgical method. Overall, the findings of this study suggest that laser surgery offers several advantages over open surgery, including lower rates of post-operative complications, shorter hospital stays, less pain, and a quicker return to normal activities.

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INTRODUCTION

The term piles, also known as haemorrhoid. Haemorrhoids refers to symptoms arising from anal cushion. Haemorrhoids are naturally occurring vascular structures in the rectal mucosa that include loose connective tissue, smooth muscle (specifically Treitz muscle), and blood vessels with numerous arteriovenous connections. This anatomical feature is why hemorrhoidal bleeding tends to be bright red. These vascular cushions are believed to help in stool retention by adding bulk to the anal canal.

Typically, haemorrhoids are located in three primary positions:

- Left lateral(3'o clock)
- right anterior(11'o clock)
- right posterior(7'o clock)

They receive their blood supply from the superior, middle, and inferior hemorrhoidal arteries. Venous drainage occurs through the inferior and middle hemorrhoidal veins, which subsequently empty into the iliac vein.

Haemorrhoids are classified into four grades:

- Grade I: Haemorrhoids bulge into the anal canal without prolapsing.
- Grade II: Haemorrhoids prolapse during defecation but retract on their own.
- Grade III: Hemorrhoids prolapse during defecation and must be pushed back manually.
- Grade IV: Haemorrhoids are prolapsed and cannot be pushed back, often necessitating surgical intervention[1] .

Conditions that increase intra-abdominal pressure, such as pregnancy and exercise, or those that weaken the supporting tissue, predispose to symptomatic haemorrhoids.

REVIEW OF LITERATURE

Despite its frequency and low morbidity, haemorrhoids have a significant impact. In this review, we discuss the anatomy, presentation, and treatment of symptomatic haemorrhoids.

The mucous membrane features protrusions known as "anal pads," which are composed of loose connective tissue, smooth muscle, arteries, veins, and the anorectal vascular plexus (hemorrhoidal plexus). The formation of anal pads occurs in late foetal development[2] . The role of anal pads is to maintain anal occlusion and allow greater stretching of the anus during defecation.

Physiologically, the anal pads make up about 15% of the resting pressure of the anus[3] . During defecation, the external anal sphincters relax and allow the vascular plexus to close the anal cushions . The anal cushion is supported by fibroelastic tissue and subepithelial smooth muscle of the anus. This subepithelial smooth muscle, known as the suspensory ligament or muscle of Treitz, is a continuation of the external rectal longitudinal muscle fibres that pass medially and caudally through the internal anal sphincter, forming a framework for the submucosal vascular spaces[4]. The rectal area has a network of blood vessels called the anorectal vascular plexus. This network is special because it's formed by the direct connection of arteries and veins .This network of interconnected vessels plays a crucial role in maintaining blood supply and venous drainage in the anal canal and surrounding area. The intricate arteriovenous connections within the plexus help regulate blood flow and pressure, which is important for various physiological functions which includes maintaining tissue integrity and supporting the anal cushions during activities like defecation. (Fig. 1)

"The anorectal vascular plexus is a network of blood vessels in the rectum. Within this network, the walls of some veins contain more smooth muscle cells than usual. These muscular thickenings can help regulate blood flow to some extent in the anal canal and surrounding area. This muscular arrangement is crucial for maintaining vascular tone and controlling the blood supply to the anal cushions and other tissues of the anorectal region. It supports “functions such as faecal continence and the prevention of hemorrhoidal swelling by regulating venous pressure and blood return outflow’’[5] .

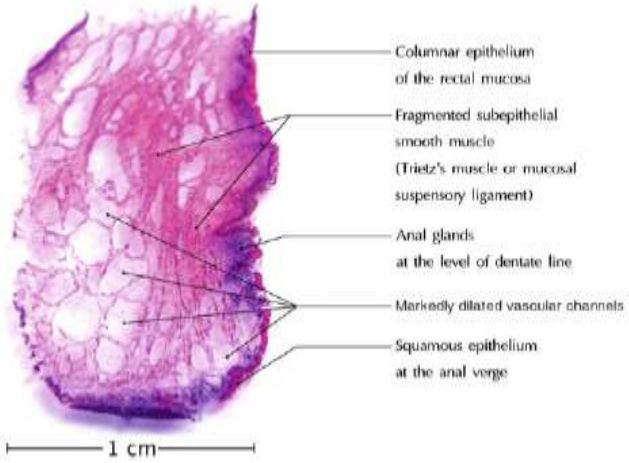

Figure 1: Histopathologic changes in advanced haemorrhoids

There are usually three large pads located on the right front, right back, and left side of the anus. However, there may be several small anal pads between them [6]. Haemorrhoids are often described as abnormally swollen anal pads or the downward displacement of anal pads. In "patients with haemorrhoids, the anal pads exhibit notable pathological changes, including significantly dilated vascular channels, venous congestion, and disrupted subepithelial smooth muscle (Figure 1). These changes contribute to the characteristic symptoms associated with haemorrhoids, such as pain, swelling, and bleeding during bowel movements. Classified by location, internal haemorrhoids arise from mucosa above the dentate line. External haemorrhoids originate from mucosa located below the dentate line. Unlike internal haemorrhoids, which are covered by mucosa and are not sensitive to pain, external haemorrhoids are covered by the anoderm (transitional area between the rectal mucosa and the perianal skin). This covering makes external haemorrhoids somatically innervated and sensitive to pain, touch, and temperature. Therefore, external haemorrhoids can cause discomfort, pain, itching, and irritation, especially when they become swollen or thrombosed.

Hemorrhoidal plexus above the tooth line, and painful stimuli as the cause of haemorrhoids , other small studies also support this claim[7] .

ANORECTAL PHYSIOLOGY IN PATIENTS WITH HAEMORRHOIDS:

Physiological changes in the anus of patients with haemorrhoids have been relatively little studied. “They found that mean resting rectal pressure was significantly higher in patients with haemorrhoids compared to the normal controls. Interestingly, despite these differences in pressures, which are likely due to vascular abnormalities rather than structural differences in the anal sphincter muscles controls[8].

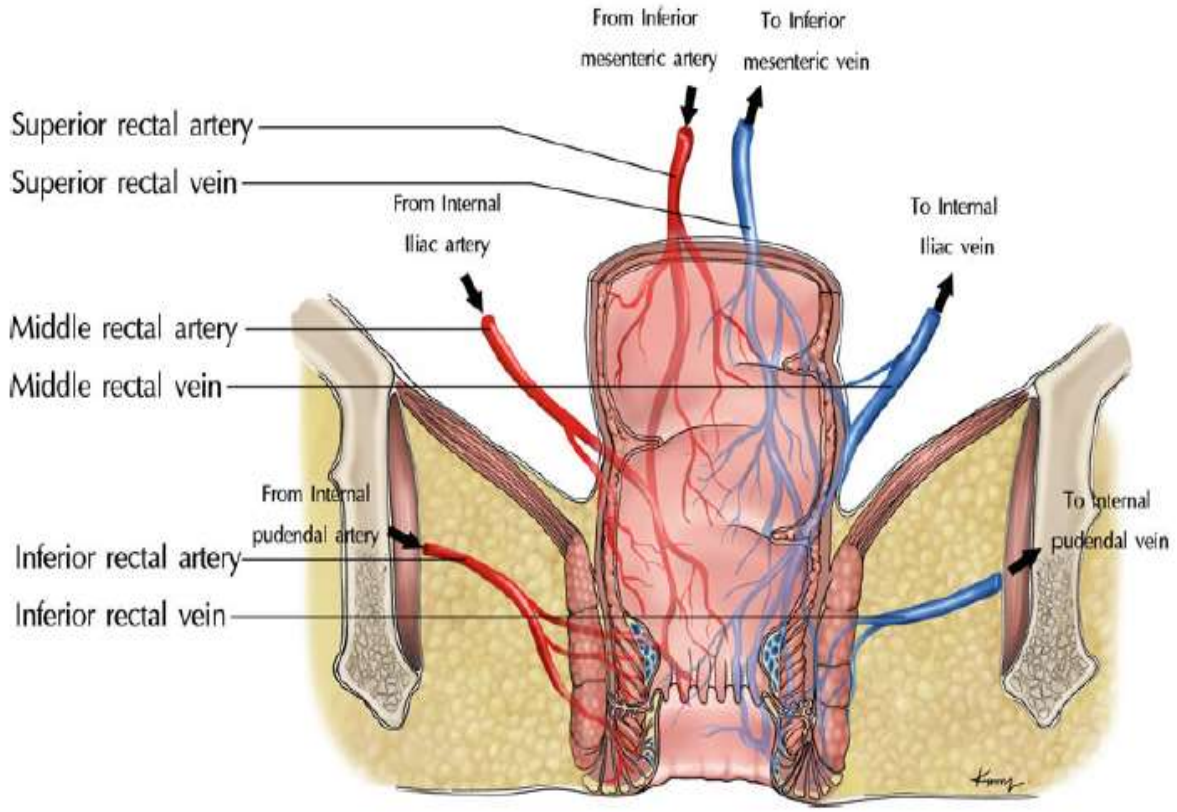

Figure 2:Anatomy of anorectal vasculature

In 1992, Sun and colleagues conducted a study using direct manometry and ultrasonography to examine anorectal physiology in patients with haemorrhoids compared to age-matched normal subjects. They found several significant differences in anal pressures and rectal function between the two groups. Although peak baseline and systolic pressures

did not differ significantly between the groups, the maximum residual pressure during rectal distension was notably higher in haemorrhoid patients.

This suggests that the elevated anal pressures observed in patients with haemorrhoids are likely attributed to vascular abnormalities rather than structural differences in the anal sphincter muscles.

Interestingly, another physiological study indicated that patients with bleeding haemorrhoids tend to have higher resting anal pressures compared to patients with prolapsed, non-bleeding haemorrhoids. This highlights variability in the physiological presentation of haemorrhoids based on their clinical characteristics.

It was observed that abnormalities in anorectal physiology such as high resting rectal pressure and reduced rectal compliance normalized within three months post-surgery. This suggests that the physiological changes associated with haemorrhoids are likely a consequence of the condition rather than a pre-existing cause.

Overall, these studies underscore the complex interplay between vascular dynamics, anal pressures, and clinical manifestations in patients with haemorrhoids, providing insights into both the pathophysiology and treatment outcomes of this common condition. Patients with haemorrhoids were observed to exhibit notably elevated resting rectal pressure, reduced rectal compliance, and increased perineal descent. These physiological abnormalities, however, were found to revert to normal levels within three months following surgical intervention.

This indicates that the anorectal physiological changes observed in these patients were likely a transient consequence of the haemorrhoids themselves rather than a permanent condition. Consequence of the haemorrhoids than the cause. Other small studies also support this claim[7] . Vascular abnormalities are implicated in both prolapsing and "non-prolapsing" haemorrhoids, supported by histological findings showing significant venous dilation in hemorrhoidal tissue specimens. These abnormalities contribute to the pathophysiology of haemorrhoids, affecting both their presentation and clinical characteristics.

“An imbalance between vasoconstrictors and vasodilators leads to dysregulation of vascular tone. In haemorrhoids, there is an observed increase in potent vasodilators such as nitric oxide, as evidenced by elevated levels of inducible nitric oxide synthase in

hemorrhoidal tissue. Additionally, the properties of endothelin (ET) receptors, which regulate vascular smooth muscle function, were investigated in haemorrhoid tissue.

These findings collectively suggest that alterations in vascular physiology, including increased nitric oxide production and differential expression of endothelin receptors favouring vasodilation, contribute to the pathophysiology of haemorrhoids, characterized by enhanced blood flow dynamics within the anorectal region. In patients with haemorrhoids, the diameter of the terminal branches of the superior rectal artery supplying the rectal cushion was significantly greater than in healthy volunteers. Interestingly, increase in arterial calibre and flow correlate well with the degree of hemorrhoids[9] .

Venous blood pressure can be another cause of haemorrhoids. Venous hypertension can be caused by inadequate venous drainage (e.g., increased intra-abdominal). Haemorrhoids are often associated with increased intra-abdominal pressure, which can occur during pregnancy and due to conditions like constipation. Additionally, venous reflux in the pelvic region has been linked to haemorrhoid development. A recent study focused on women with pelvic venous reflux found that approximately one-third of these cases showed haemorrhoids identified via transvaginal duplex ultrasound. The haemorrhoids were visualized as direct tributaries of internal iliac vessels. Importantly, the incidence of haemorrhoids was found to increase with the number of pelvic venous trunks involved . This underscores the relationship between pelvic venous congestion and the development of haemorrhoids in affected individuals. Prolonged elevation of arterial venous pressure, such as haemorrhoidal plexus, damages the vessel.

In addition to high arterial blood flow and elevated venous blood pressure within the anorectal plexus are associated with vascular non unity. For instance, Chung and colleagues reported findings related to endoglin, which acts as a receptor for transforming growth factor-beta and serves as a marker of proliferating endothelial cells, was expressed in most haemorrhoidal samples compared with normal anorectal mucosa associated with high expression of angiogenesis-related proteins, including vascular endothelial growth factors[10].

Rectal redundancy refers to the excessive length or redundancy of the rectum, which can contribute to various anorectal conditions, including haemorrhoids. This condition can lead to altered pressures within the rectum and anorectal canal, potentially exacerbating the development or symptoms of haemorrhoids[6] .

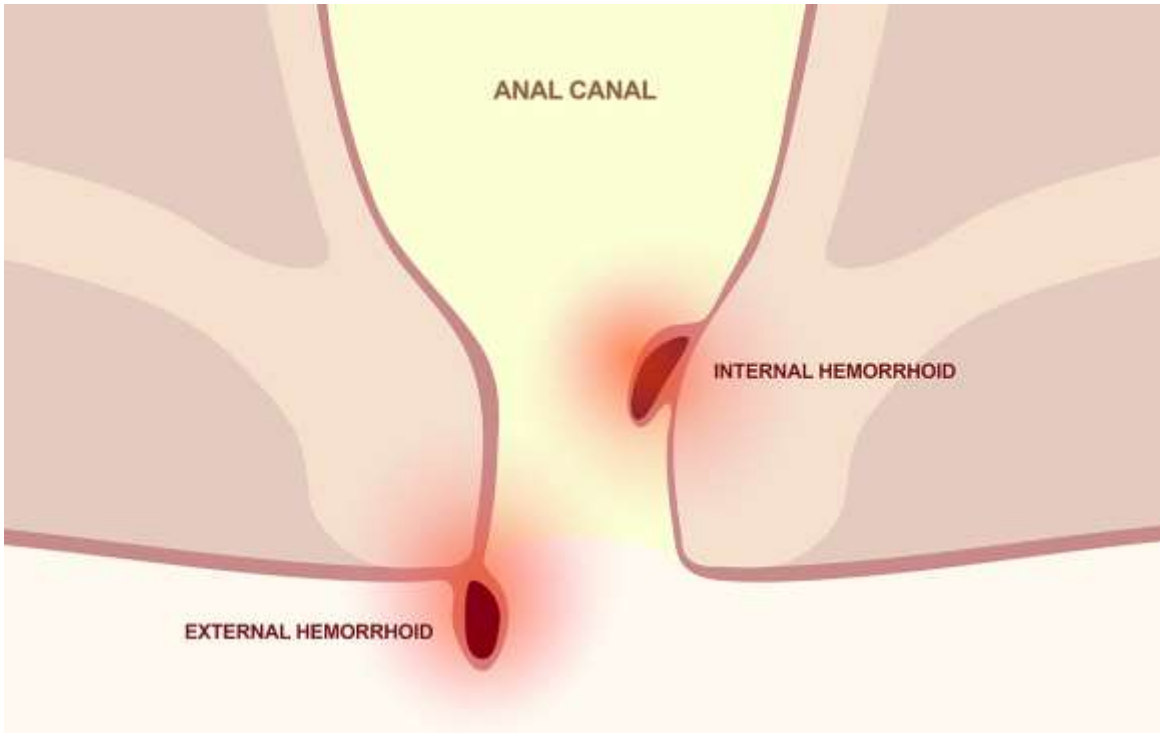

Figure 3: Types of Haemorrhoids

Rectal excess can prevent the proper attachment of the supporting tissue along with obstructed bowel symptoms, such as straining and hard stools, leading to obstructed and prolapsed haemorrhoids. In daily practice, it is often observed that the redundancy of the rectum can disrupt the normal attachment of the rectal cushions to the rectal wall, contributing to the development and exacerbation of haemorrhoids. This can lead to complications such as increased vascular congestion and pressure within the hemorrhoidal plexus, further promoting the prolapse of hemorrhoidal tissue[11] .

Increased pressure on the anorectal plexus is a result of the integrated sensorimotor activity involving the colon, rectum, anus, pelvic floor muscles, and associated neural pathways during defecation[12] . Abnormally high intra-abdominal pressure , causing bleeding of the anal pad and haemorrhoids. A number of conditions associated with increased pressure within the rectum, especially during conditions like constipation or straining during defecation, can significantly impact the venous drainage of the anorectal vascular plexus. Increased intra-abdominal pressure, combined with elevated rectal pressure, can lead to venous congestion and stasis within the hemorrhoidal veins. This, in turn, contributes to the development and exacerbation of hemorrhoids. Efficient venous drainage is crucial for maintaining normal vascular function in the anorectal region, and disruptions due to elevated pressures can lead to vascular engorgement and hemorrhoidal symptoms.

Increased intra-abdominal pressure is considered as an contributing factor to the development of hemorrhoids and can exacerbate symptoms in acute cases. These factors lead to increased pressure within the veins of the anorectal area, potentially causing venous congestion, dilation, and hemorrhoidal symptoms such as pain, swelling, and bleeding. Management often focuses on reducing these contributing factors to alleviate symptoms and prevent recurrence.

Factors predisposing to hemorrhoids include heredity, although the specific genetic basis remains unclear despite advancements in genetic research. Loder and colleagues highlight that a positive family history is often observed, indicating a familial tendency towards the condition[13] .

However, such a strong genealogy can be explained by more important common factors such as shared dietary habits, lifestyle choices, and possibly a genetic predisposition that influences susceptibility to venous disorders in general. "diet, culture, behaviour and other environmental factors rather than genes. Burkitt and Graham Stewart point out that, in contrast, there is a similar situation in black and white Americans in Africa and signs of increased prevalence due to lifestyle changes indicates that heredity is not an important causative factor[14].

ANATOMICAL FACTORS

The absence of valves in the portal venous system may contribute to venous congestion and thus predispose individuals to haemorrhoids, it's important to clarify that this is not a direct cause-and-effect relationship. Haemorrhoids are characterized by rich vascularization and can be influenced by various factors such as increased intra-abdominal pressure, chronic constipation, pregnancy, and genetic predisposition.

The absence of valves in the portal venous system can exacerbate venous congestion in the anorectal area, potentially worsening hemorrhoidal symptoms in susceptible individuals. Therefore, while it is a contributing factor, it does not solely cause haemorrhoids and correspondingly extensive venous return to the portal and systemic venous circulation. There is significant communication between these circulations, allowing for a safety valve mechanism to accommodate elevated portal venous pressure through the systemic veins,

including the middle and inferior rectal veins. Varicose veins of the rectum, though rare, do occur and present with a distinct appearance compared to haemorrhoids. than haemorrhoids.

FAECAL STRAINING

Given the current understanding of the haemorrhoids ,the breakdown of the supporting structures can lead to haemorrhoids, it seems reasonable to assume that trauma from prolonged straining to pass a hard stool (constipation) or experiencing repeated trauma from frequent explosive stools (diarrhoea) can indeed contribute to the development of haemorrhoids. Over time, these factors can lead to the breakdown of supporting structures in the anorectal region and contribute to the progressive prolapse of hemorrhoidal tissue.

AGE

Age is also considered a factor in the development of haemorrhoids. As individuals age, the supporting tissues in the rectal area may weaken, making them more susceptible to developing haemorrhoids. Additionally, age-related changes in vascular function and tissue elasticity can further predispose older individuals to hemorrhoidal symptoms.

Therefore, a combination of lifestyle factors such as diet, bowel habits, and age-related changes in anatomy and physiology can contribute to the onset and progression of haemorrhoids.

Contributions from various authors suggest that with advancing age, there is a loss of support as muscle mass (M) decreases and is replaced by connective tissue (C). This change can lead to sagging of the rectal pads and an increased likelihood of protrusion. Haas and Fox discussed the concept of the C/M ratio, where the ratio of connective tissue to muscle mass increases with age. As this ratio shifts, there is a greater tendency for haemorrhoids to migrate downwards or for prolapse to occur more frequently over time[15] .

OCCUPATION

Paradoxically, Gabrielo points out that both "men who do hard physical work" and sedentary workers who regularly exercise on holidays or perhaps were too enthusiastic in their garden[16] are prone to haemorrhoid symptoms. In other words, there is no known link to a specific occupation. Rankin and colleagues note that while certain occupations may involve prolonged sitting or heavy lifting, which could theoretically contribute to haemorrhoid symptoms, there is no conclusive evidence linking any specific occupation directly to the development of hemorrhoids [17].

SOCIOECONOMIC STATUS

According to Ebstein, haemorrhoids are particularly common among the better classes, less common in sober and active life[13].The increased prevalence of hemorrhoids in more industrialized and developed societies may be attributed to dietary habits rather than specific nutritional deficiencies. Western diets, characterized by low-fibre content and processed foods, are known to contribute to constipation and increased strain during defecation, which are significant risk factors for hemorrhoids.

While nutrition plays a crucial role in overall health, there is no direct evidence linking specific nutritional deficiencies to the prevalence of hemorrhoids. Instead, dietary patterns that promote constipation and straining during bowel movements are more closely associated with the development and exacerbation of hemorrhoidal symptoms.status[14] .

GENDER

Some studies indicate a trend among men when it comes to the development of haemorrhoids. Gabriel notes that women often develop haemorrhoids due to activities such as spring cleaning, moving heavy objects or the prolonged effort required to take care of an incapacitated person.

Although there are studies that involve either men or women, the disease can be seen equally in. both sexes. The degree of activity is both active exercise and sitting are blamed "Neither proposition receives epidemiological support[14] . Long-term occupations, including tram drivers, postmen, etc., are very susceptible to haemorrhoids after middle age. Again,

"middle-aged " more likely is the case promotes space as an indirect consequence of prolonged standing.

Men with an enlarged prostate or urethral stricture may develop haemorrhoids as a result of ordinary exertion[16] . The typical advanced age of these patients certainly contributes to the progressive symptoms of prolapse. Gabriel used the term "rectal obstruction" to highlight that individuals who are of large build, engage in habitual gluttony, having portal obstruction, or obese are

more prone to developing haemorrhoids. Additionally, people who spend extended periods riding horses or sitting for prolonged hours, such as those in the tailor's trade, are also predisposed to haemorrhoids.

There is no established direct relationship between body habitus, prolonged sitting, and riding horses specifically causing haemorrhoids. However, vascular diseases like varicose veins elsewhere in the body, as noted by Captain Cleave, surgeon of the British Royal Navy, suggest that the underlying mechanisms leading to varicose veins and femoral vein thrombosis share similarities with those contributing to haemorrhoids [18] . He asks, "Is the body built wrong, or is it built right but used wrong"? He continues to attribute these diseases to a "refined" low-fat diet. While this assertion may hold some truth, there is no proven correlation between these different types of vascular diseases and haemorrhoids.

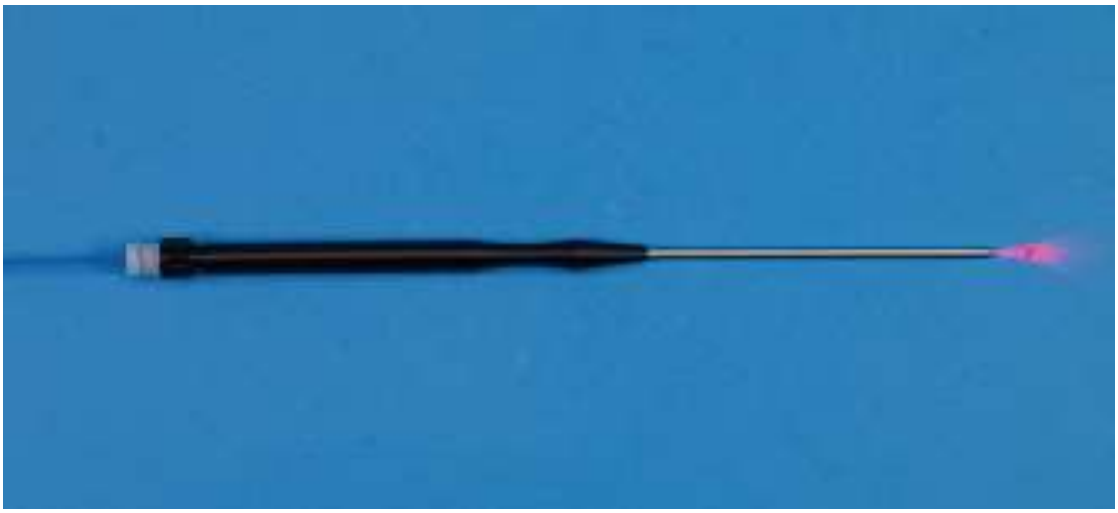

Figure 4: Optic Fiber

"HeLP" (Laser Haemorrhoid Procedure) is another procedure used to de-arterialize haemorrhoids. The procedure, resembling DGHAL/THD techniques, involves Doppler-guided hemorrhoidal arterialization using a 1470 nm diode laser. It offers potential

advantages over traditional methods due to its minimally invasive nature and avoidance of anaesthesia. The laser operates at a wavelength that maximizes absorption by haemoglobin, leading to vasoconstriction in arterial blood with minimal mucosal damage. This aims to contract submucosal arteries.

Arteries at this level typically lie about 2 mm beneath the mucosa and vary in calibre from 0.6 to 2 mm. Given this variability, Doppler is crucial for precise arterial localization and treatment, identifying and closing around 12 arterial branches per session with minimal patient discomfort, obviating the need for anaesthesia. Disposable instrumentation is used for the procedure, including a 23 mm diameter proctoscope with a 3 mm Doppler probe window. Fibre through the same window to contract the artery. Artery occlusion is confirmed by repositioning the Doppler probe, ensuring the absence of sound[19] . HeLP employs a 20 MHz Doppler probe, differing from DGHAL/THD techniques, which use lower frequency probes[20] .

Figure 5: Side viewing Proctoscope

In contrast to traditional methods, where arteries are sutured at varying distances from the pulse location, HeLP precisely targets arteries based on Doppler signal localization. Furthermore, HeLP closes a greater number of arteries (12 compared to 6 or 8 in DGHAL/THD), optimized through prior in vitro studies on pig tissues to minimize mucosal damage and thermal effects[21], employing closed (Ferguson) or open (Milligan-Morgan) techniques depending on regional preference.

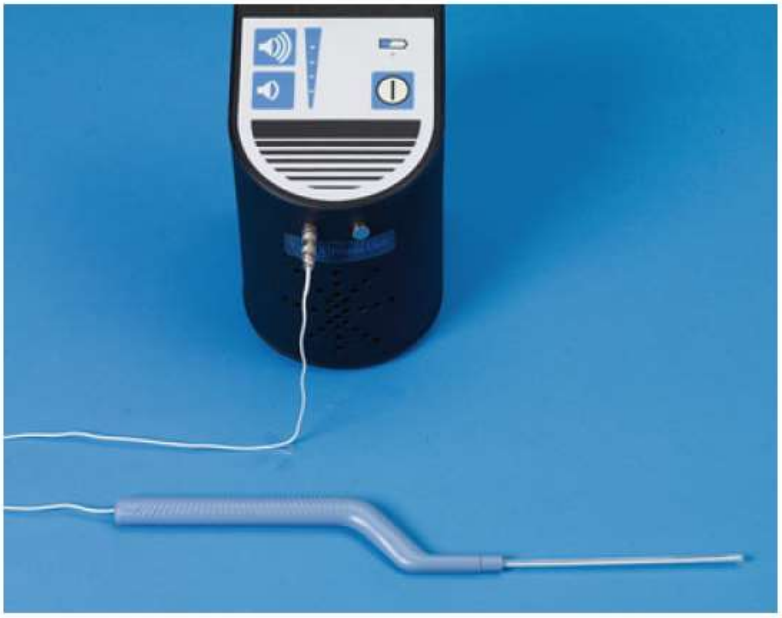

Figure 6: Doppler probe

Hemorrhoids can be managed through medical or surgical interventions, tailored to their type and extent of protrusion—whether internal or external. An initial and crucial conservative approach involves adopting a high-fibre diet. Garg recommends supplementing with 4 to 5 teaspoons of fibre daily, equivalent to 20 to 25 grams, to effectively soften stools and prevent stomach cramps. Concurrent intake of 500 ml of water is essential to facilitate water absorption and stool softening. This dietary intervention has demonstrated efficacy in halting haemorrhoid progression and reducing prolapse size[22].

Rubber band method and infrared coagulation are recommended for grade 1 and 2 hemorrhoids that do not respond to conservative treatment[23] .

During the procedure, a Hill Ferguson retractor is used to visualize the haemorrhoid columns, and other necessary equipment may include:

- Bowel preparation is typically unnecessary, although an enema may clear the rectum of stool.
- Preoperative antibiotics are not routinely required.
- Anaesthesia choice is determined after discussion among the patient, surgeon, and anaesthesiologist, with consideration for the potential risk of urinary retention associated with spinal anaesthesia.
- Surgeons often prefer the lithotomy or prone position for the operation, with buttocks taped separately.

The surgical technique commonly employed is the closed haemorrhoidectomy (Ferguson technique), predominant in the United States, focusing on excising hemorrhoidal tissue using an elliptical incision. This method involves ligating the hemorrhoidal stem and closing the rectal mucosa, anoderm, and perianal skin with sutures to minimize the risk of recurrent prolapse.

In addition to traditional approaches, stapled hemorrhoidopexy is an alternative surgical method where hemorrhoids are not excised but instead stapled and elevated above the anal verge.

These procedures aim to effectively manage hemorrhoids based on their severity and associated conditions, ensuring optimal patient outcomes. Studies show a high recurrence rate and microscopic attachment of the sphincter to the resection specimens, causing transient flat incontinence[27] .

COMPLICATIONS

After undergoing haemorrhoidectomy or hemorrhoidopexy, patients can expect to experience pain and a sensation of fullness in the anal area during the initial week post-surgery. Managing pain effectively and using stool softeners are crucial during the recovery phase.

Early complications may include:

- Bleeding
- Difficulty urinating (urinary retention)
- Thrombosed external hemorrhoids

Although rare, critical complications that require prompt recognition include sepsis, abscess formation, severe bleeding, and peritonitis.

- Late complications can include:
- Anal stricture (narrowing of the anus)
- Skin tags
- Recurrence of hemorrhoids
- Delayed bleeding
- Faecal incontinence

Managing these complications involves close monitoring during the recovery period and may necessitate further medical intervention depending on the severity of symptoms.

Diptangshu Das, Manojit Barman et al[28]. (2024), The study conducted by Das and Barman et al. in an observational study focused on evaluating the outcomes of laser hermorrhoidoplasty and a combination procedure of Finger-Guided Hemorrhoidal Artery Ligation (FGHAL) and Laser Hemorrhoidoplasty for the treatment of haemorrhoidal disease in a tertiary care centre. The researchers analysed the demographic distribution of 80 patients with haemorrhoids finding that the majority were aged 50-59 years. Sixty percent of the patients were female, and all experienced constipation, bleeding, and pain. The results showed that the combined procedure (FGHAL+LH) had a lower number of complications compared to laser hemorrhoidoplasty alone. However, the authors suggested that larger

multicentric studies would be needed to validate these findings, and that varying to better understand the clinical implications.

Haluk Tümer , Mevlüt Harun et al.[29] (2023) conducted a retrospective analysis comparing laser hemorrhoidoplasty and open hemorrhoidectomy The study's primary focus was on postoperative pain, with secondary. Laser hemorrhoidoplasty was associated with significantly lower postoperative pain and less intraoperative bleeding compared to open haemorrhoidectomy. However, recurrence rates were higher in the laser group (9.4% versus 2.5%). Despite the higher recurrence rate, patients undergoing laser hemorrhoidoplasty had shorter recovery times and returned to work earlier but recommended further study to address the higher recurrence rate.

Ahmed M. Sabry, Mohamed H. Zaid et al[30] (2023) conducted a prospective randomized trial to compare Stapler Haemorrhoidopexy (SH) and Laser Hemorrhoidoplasty (LH) in the management of third-degree piles and evaluated for postoperative pain, bleeding, and recurrence. LH showed better outcomes in terms of. SH, however, had less postoperative pain after 24 hours and fewer late complications like anal stenosis and recurrence. The authors concluded that SH had overall better outcomes and suggested that liberal use of LH in third-degree hemorrhoidal disease should be regulated due to higher late postoperative complications like postoperative pain ,bleeding and recurrence rates.

Dr. Alaa Shather Esmael et al[31]. (2023) conducted a comparative study to evaluate anaesthesia techniques used in open haemorrhoidectomy surgery, focusing on local and spinal anaesthesia. The study involved 120 patients with hemorrhoids and examined complications, pain levels, and other postoperative outcomes. The results indicated that local anaesthesia had a lower postoperative complication rate (13.33% versus 26.67% with spinal anaesthesia). Thrombosis was the most frequent complication, followed by haemorrhage and urinary retention. The Visual Analog Scale (VAS) score showed that pain levels were reduced for patients who received local anaesthesia compared to those who received spinal anaesthesia. The authors concluded that local anaesthesia is a more effective option for haemorrhoid pain management with fewer complications.

Amir F. Abdelhamid, Mohamed M. Elsheikh, et al[32]. (2023) conducted a prospective randomized study comparing laser hemorrhoidoplasty combined with blind hemorrhoidal artery ligation to Milligan–Morgan hemorrhoidectomy Sixty-six patients were randomly divided into two groups, with the primary focus on postoperative pain, satisfaction, and

complications. Results showed that the combined approach had a shorter operative time and hospitalization period, lower pain scores, and higher satisfaction compared to the Milligan–Morgan procedure. The incidence of complications did not differ significantly between the two groups except for urinary retention. The combined approach also led to an earlier return to daily activities. concluded saying combination of laser with hemorrhoidal artery ligation offers multiple advantages, including better analgesic profile and faster recovery.

Kai-Hsiang Chen, Yi-Ling Huang et al[33]. (2023) conducted a retrospective study focusing on laser hemorrhoidoplasty with feeding vessels suture ligation for grade II–III hemorrhoids. The study included 173 patients who underwent laser hemorrhoidoplasty with feeding vessels suture ligation, with a follow-up period that provided insights into postoperative outcomes, including pain levels, complications, and recurrence rates. Results showed a median pain score of 3 at four hours postoperatively. Complications were relatively low, with 5.2% experiencing bleeding and 6.9% reporting a symptomatic recurrence. The procedure also led to reduced postoperative discomfort, minimal bleeding, and a lower recurrence rate. The authors concluded that this combined approach is secure and efficient for managing grade II and III hemorrhoids. However, vigilant oversight and further studies are needed to ensure optimal outcomes and address possible complications.

Seerwan Hama Shareef et al[34]. (2023) conducted a prospective cohort study comparing ligation and cauterization of the hemorrhoidal pedicle with Milligan-Morgan hemorrhoidectomy. The study included 200 patients and aimed to assess postoperative outcomes, including pain ,bleeding ,recurrence rates. The findings indicated that patients in the ligation and cauterization group experienced less pain and had lower rates of postoperative complications compared to those who underwent Milligan-Morgan hemorrhoidectomy. Despite the higher incidence of surgical site infection, the ligation and cauterization group had fewer cases of postoperative urinary retention and anal stenosis. The authors concluded that ligation and cauterization are safe and cost-effective, leading to shorter hospital stays and earlier return to work. Future studies are recommended to compare this technique with other surgical procedures.

Mohamed Ahmed Nagdy, Mahmoud Mohamed Abu Al-Yazid et al[35]. (2022), conducted a study which included 30 patients, with one group undergoing laser hemorrhoidoplasty. The outcomes assessed were operative time, postoperative bleeding, pain levels, and recovery time. The results indicated that laser group had shorter operative times,

lower postoperative pain, and fewer postoperative complications compared to Milligan Morgan Haemorrhoidectomy. However, the laser group showed a higher recurrence rate, particularly with fourth-degree haemorrhoids. The authors concluded that laser technique is generally superior to Milligan Morgan haemorrhoidectomy due to its safety and efficacy, especially with shorter operative time and lower postoperative pain. Nonetheless, the recurrence rate in more severe cases requires further investigation and larger-scale studies to clarify these findings.

Kamal Gupta, Niranjan Agarwal et al[36] (2021) This retrospective cohort study by Kamal Gupta, Niranjan Agarwal, and others analysed the outcomes of the surgical management of haemorrhoids. The primary outcomes assessed were postoperative pain, bleeding, and resolution of symptoms. Postoperative pain was measured at various intervals, with a VAS score of 3 at 6 hours post-surgery, reducing to 0.1 by 72 hours. No spontaneous bleeding occurred after surgery, although post-defecatory bleeding was noted that bleeding resolved in all patients by the seventh day. After six months, 90.2% of patients had completely resolved symptoms. The study concluded that FGHAL with LHP offers a low pain and discomfort period with minimal analgesic requirements and is a cost-effective treatment option

In this trial, Halit Maloku and Zaim Gashi et al[37] (2014) compared the outcomes of Laser Hemorrhoidoplasty (LHP) with Open Surgical Haemorrhoidectomy (OSH) in treating third and fourth-degree haemorrhoids. Conducted at Aloka hospital in Kosovo, the study enrolled 40 patients, with 20 patients treated with LHP and 20 with OSH. The study concluded that LHP is preferable to open surgical hemorrhoidectomy, offering shorter operative times and significantly less postoperative pain. This technique also requires less intensive postoperative care, making it a more patient-friendly option for treating third and fourth-degree haemorrhoids.

AIMS AND OBJECTIVES

To compare the post operative outcomes following the laser hemorrhoidoplasty and open hemorrhoidectomy.

The variables that are being compared are

1. Post operative pain.
2. Post operative bleeding.
3. Post operative mobility.
4. Duration of surgery.
5. Return to work.

MATERIALS AND METHODS

Study period : January 2023 to December 2023

Collection Period : One year

All patients coming to the institution with symptomatic grade 2 and grade 3 haemorrhoids during the study period and willing to undergo laser hemorrhoidoplasty or open hemorrhoidectomy and to provide the voluntary consent to participate in the study

Sampling Technique

GROUP A – CONVENTIONAL OPEN HEMORRHOIDECTOMY

GROUP B - LASER HEMORRHOIDOPLASTY

All patients coming to the institution with symptomatic grade 2 and grade 3 haemorrhoids during the study period and willing to undergo hemorrhoidoplasty and to provide the voluntary consent to participate in the study. The included patients will be randomised into two groups either to laser hemorrhoidoplasty(30) or conventional open haemorrhoidectomy(30) based on envelope method with 30 patients in each group are enrolled in the study to achieve statistical significance

Sample size – 60(laser 30 and open 30)

Sample size formula:

The formula used for sample size calculation is $n = \frac{2\left(Z_{\alpha/2}+Z_{\beta}\right)^2}{d^2}$

$$\text{where, } d = \left(\frac{|\mu_1 - \mu_2|}{\sigma}\right)$$

where, μ_1 is mean of the first group, μ_2 is mean of the second group, σ^2 is the common error variance, $Z_{\alpha/2}$ value is 1.96 for 95% confidence level and Z_{β} value is 1.0364 for 85% power.

Inclusion Criteria:

- Patients with symptomatic grade 2 and grade 3 haemorrhoids
- Age >21 years

Exclusion Criteria:

- Patients with associated anorectal conditions(fistula, abscess, rectal carcinoma, inflammatory bowel disease)
- First and fourth degree of haemorrhoids
- Pregnancy
- Patients unfit for surgery
- Ulcerated/Thrombosed hamenorrhoids.

Procedure:

Group A: Conventional Open haemorrhoidectomy:

A V-shaped incision was made in the skin surrounding the base of the haemorrhoid. Then dissection in the submucous space was done by cautery to strip the haemorrhoid from its bed. The dissection was continued in the cranial direction up to the pedicle. The pedicle was then ligated with a 2/0 vicryl suture, and the distal part of the haemorrhoid was excised. Same steps were carried out regarding the other haemorrhoids, leaving a skin bridge between them to avoid anal stenosis. The wounds were left open, light dressing with topical sucralime ano cream and a gauze was left in the anal canal. The time of the operation was recorded in minutes.

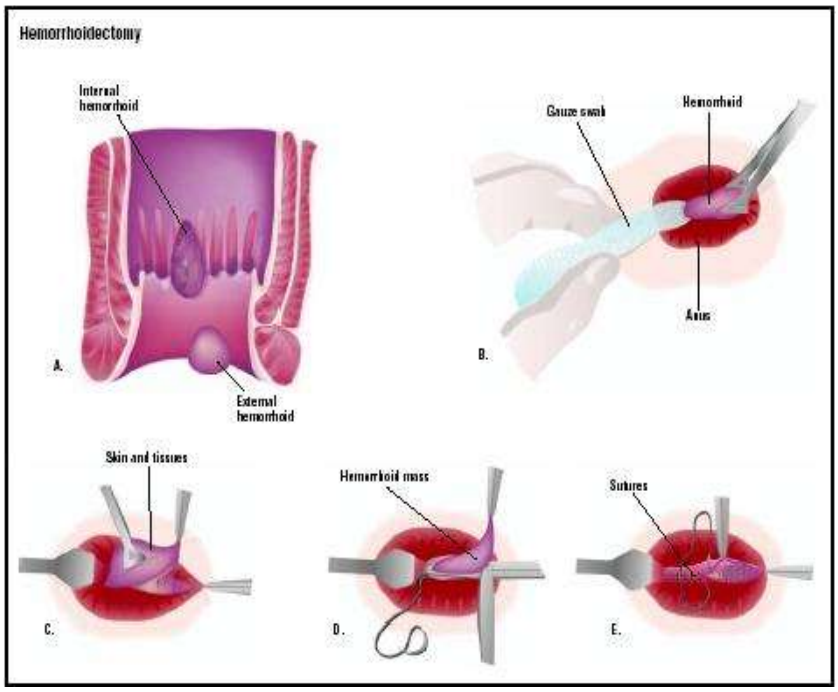

Figure 7: Conventional Open haemorrhoidectomy procedure

Figure 8: Pre op instrument trolley

Group B: Laser hemorrhoidoplasty:

LASER SETTINGS: 1470 nm , Pulse mode, maximum joules 150-200 joules per hemorrhoid

During introduction of laser fibre -6 W, 1 sec(Pulse mode)

During activation of laser fibre - 6W,3 sec(Pulse mode)

The laser procedure performed using the (lasotronix laser) and start with proper per rectal examination in lithotomy position. A dedicated side viewing proctoscope (23 mm in diameter) was inserted in the anal canal. The procedure starts via small incision at the muco cutaneous junction (white line of Hilton). At the base of each haemorrhoid the laser fibre to be introduced into the hemorrhoidal plexus taking into consideration that the fibre should be parallel to the anal canal to avoid injury or burn of the mucosa or internal sphincter. Using a 1470 nm diode laser, before activation of laser fibre, we must wear antiglare glasses. The depth of shrinkage can be controlled by the power and duration of the laser beam. Through the optic fibre, laser shots were generated at a power of 6 W with duration of 3 s each shot followed by a pause of 0.5 s causing shrinkage of tissues up to the depth of 5 mm. During activation of laser fibre , rotatory motion of the fibre is done to prevent the adhesion of tissues. After the procedure ice finger is inserted for about 8-10 minutes and operation time is recorded in minutes and patient is shifted to recovery

Figure 9: Laser hemorrhoidoplasty procedure

STATISTICAL ANALYSIS:

The data will be initially captured into the customised proforma which developed for the specific requirement of the study. Then this data will be transferred to Microsoft excel for analysis ,statistical software IBM SPSS Version 20.0.0 will be used for calculating the p value. Descriptive statistics will be presented in the form of numbers and percentages. Proportional comparisons will be done using z test for two sample proportions association between 2 non parametric variables will be tested using Pearson chi square test and comparison of means of more than 2 groups will be done using one way ANOVA test . A p value ≤ will be taken as statistically significant.

Data will be analysed using statistical software R version 4.2.0 and Microsoft Excel. Frequency tables will used to represent categorical variables. Continuous variables will be represented by Mean ± SD / Median (Min, Max) form. Chi-Square test will used to check the association between categorical variables. Normality of variable is checked by Shapiro Wilk test and QQ plot. Two sample t test/Mann Whitney U test can be used to compare means/distributions of variables between the groups. P-value less than or equal to 0.05 indicates statistical significance.

RESULTS

AGE:

Table 1: Association between type of surgery and age group

Age Group		TYPE OF SURGERY		Total
		Laser	Open	
<30 Years	N	6	3	9
	%	20.0%	10.0%	15.0%
30-40 Years	N	8	5	13
	%	26.7%	16.7%	21.7%
40-50 Years	N	3	9	12
	%	10.0%	30.0%	20.0%
50-60 Years	N	7	4	11
	%	23.3%	13.3%	18.3%
60-70 Years	N	4	5	9
	%	13.3%	16.7%	15.0%
70-80 Years	N	2	4	6
	%	6.7%	13.3%	10.0%
Total	N	30	30	60
	%	100.0%	100.0%	100.0%
Pearson Chi-Square	Value	Df	P Value	Result
	6.29	5	0.279	Non-Sig

The above table shows the association between Type of surgery and Age Group.

The Chi square test for association between two variables was applied, which shows that the association between type of surgery and age Group was found to be non-significant and hence both the groups were comparable on basis of age distribution. (P>0.05).

For Laser type of surgery, the maximum value was about 26.7% i.e. 30-40yrs followed by 50-60yrs (23.3%), <30yrs (20.0%), 60-70yrs (13.3%), 40-50yrs (10.0%) and 70-80yrs (6.7%).

Similarly for Open type of surgery, the maximum value was about 30.0% i.e. 40-50yrs followed by 30-40yrs & 60-70yrs (16.7%), 50-60yrs & 70-80yrs (13.3%) and <30yrs (10.0%).

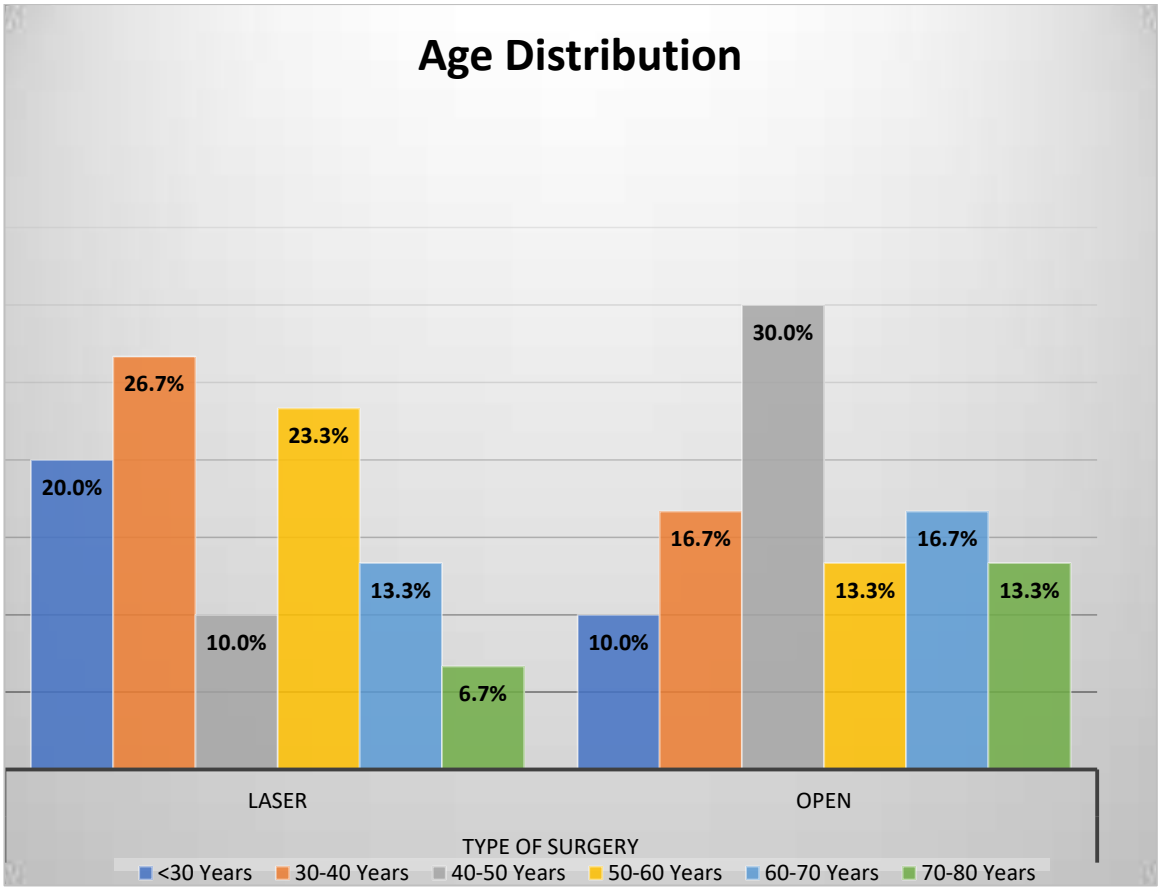

Figure 10:Association between Type of surgery and Age Group

POST OPERATIVE PAIN:

Post operative pain was evaluated using visual analogue scale at 12 ,24,48 hours in both open and laser group of surgery. It was observed that laser hemorrhoidoplasty (group B) had a significant less VAS mean score over the conventional open haemorrhoidectomy(group A) and found to be statistically significant p value(<0.05)

Post operatively both groups were given injection DOLO 1 gm as analgesia

Rescue analgesia Injection tramadol (2ml =100 mg) was given to patients whose VAS score > 5

Table 2: Comparison of Mean Pain Scores Between Type of surgery

Parameter	TYPE OF SURGERY	N	Mean Pain score	Std. Deviation	T Test	P Value	Result
Pain at 12HR	Laser	30	4.40	1.525	-6.445	<0.01	Highly Sig
	Open	30	6.37	0.980			
Pain at 24 HR	Laser	30	2.13	1.008	-6.800	<0.02	Highly Sig
	Open	30	4.27	0.887			
Pain at 48 HR	Laser	30	1.13	1.248	-7.740	<0.01	Highly Sig
	Open	30	2.80	0.615			

The above table shows the comparison of Mean Pain score at 12 Hour & 24 Hour and 48 hours between two different Type of surgery.

A Paired T test comparing the mean difference between two different types of surgery was applied, which shows that there was significant difference in the mean Pain at 12 Hour & 24-Hour and 48 hours durations(P<0.05)

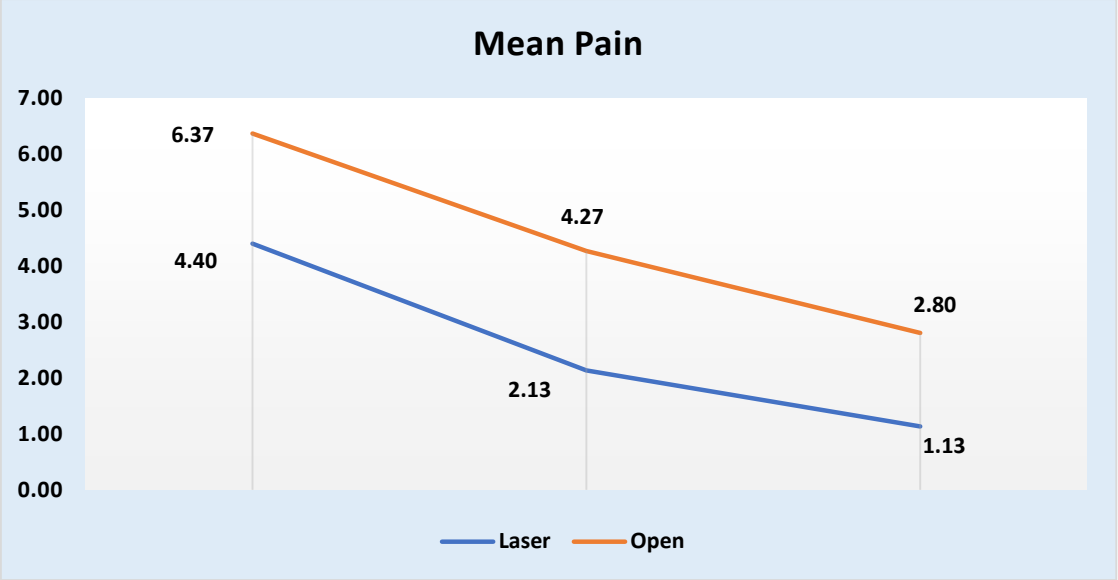

Figure 11: Comparison of Mean Pain Scores Between Type of surgery

At 12HR , the mean value of VAS was found to be 4.40 for laser type of surgery which was significantly lower than the mean pain score of 6.37 for Open Type of surgery ($P<0.05$).

At 24 HR, the mean value of VAS was found to be 2.13 for Laser type of surgery which was significantly lower than the mean value of 4.27 for Open Type of surgery($P<0.05$).

At 48 hours, the mean value of VAS was found to be 1.13 for Laser type of surgery which was significantly lower than the VAS of open type of surgery which was 2.80 ($P<0.05$).

POST OPERATIVE BLEEDING

Post operative bleeding was evaluated using staining of gauze pack at 12 ,24,48 hours post-surgery and replacement was done using a fresh gauze pack.

It was observed that open group of surgery had a significant amount of bleeding at 12,24 hours than the laser group of surgery and found to be statistically significant.

During 48 hours , bleeding was not significant in both the groups of surgery and found to be statistically insignificant.

Table 3:Association between type of surgery and Bleeding at Different durations

Bleeding at Different Durations		TYPE OF SURGERY		Total	Chi-sq	P Value	Result
		Laser	Open				
At 12 Hr	N	4	29	33	42.090	0.023	Sig
	%	13.3%	96.7%	55.0%			
At 24 Hr	N	1	20	21	24.447	0.034	Sig
	%	3.3%	66.7%	35.0%			
At 48 Hr	N	1	4	5	1.964	0.161	Non sig
	%	3.3%	13.3%	8.3%			

The above table shows the association between Type of surgery and Bleeding at different durations.

The Chi square test for association between two variables was applied, which shows that all association between Type of surgery and Bleeding at Durations was found to be significant at, 12 Hrs and 24 hrs ($P<0.05$) & non-significant at 48 Hrs ($P>0.05$).

At 12 Hour, the number of cases with bleeding was 13.3% for Laser Surgery and 96.7% for Open Surgery respectively ($P<0.05$) which is significant.

At 24 hrs ,the number of cases with bleeding was 3.3% for Laser Surgery and 66.7% for Open Surgery respectively ($P<0.05$) which is significant.

At 48 hrs , the number of cases with bleeding was 3.3% for Laser Surgery and 13.3% for Open Surgery respectively ($P<0.05$) which not significant.

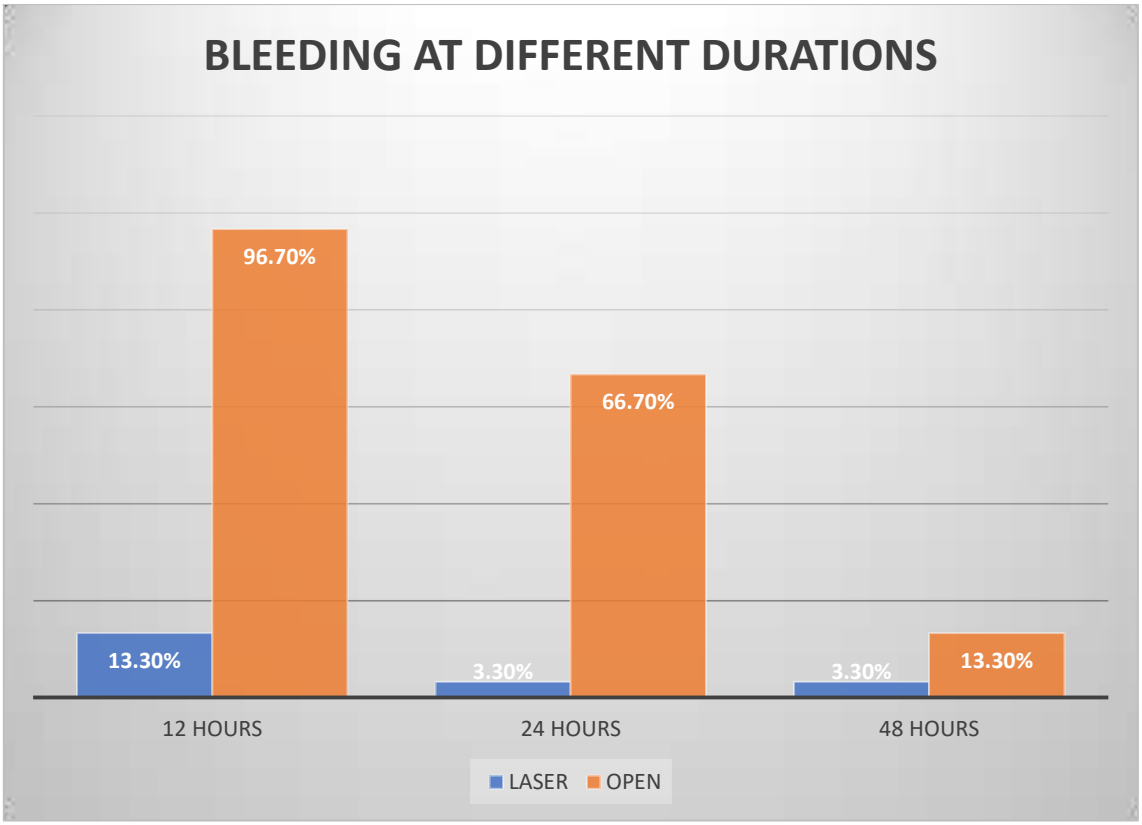

Figure 12: Association of Type of surgery and Bleeding at Duration

POST- OPERATIVE MOBILITY

Post operative mobility was observed at 3 different durations (12,24,48 Hours)

At 12 ,24 hours patients who had undergone laser hemorrhoidoplasty had better ambulation than open haemorrhoidectomy procedure and the p-value was found to be statistically significant(<0.05)

At 48 hours, both group A and B were ambulating and had no complaints. The p value was found to be insignificant.

Table 4: Association between Type of surgery and Mobility At Different Durations

Mobility at Durations		TYPE OF SURGERY		Total	Chi-sq	P Value	Result
		Laser	Open				
At 12 Hr	N	28	11	43	1.017	<0.016	Sig
	%	93.3%	36.7%	71.1%			
At 24 Hr	N	30	20	50	1.065	<0.015	Sig
	%	100.0%	66.6%	83.3%			
At 48 Hr	N	30	30	60	NA	NA	Not significant
	%	100.0%	100.0%	100.0%			

Chi square test for association between two variables was applied, which shows that all association between Type of surgery and mobility at Durations was found to be significant at 12 Hrs (P<0.05) and 24 hrs. (P>0.05) and non-significant at 48 hours.

At 12 Hours, there was significant difference as the number of cases who were mobile was found to be 93.3 % for Laser Surgery and 36.7 % for Open Surgery(P<0.05).

At 24 Hours, there was significant difference as the number of cases who were mobile was found to be 100 % for Laser Surgery and 66.6 % for Open Surgery(P<0.05).

At 48 Hours, there was no significant difference as the number of cases who were mobile was found to be 100 % for Laser Surgery and 100 % for Open Surgery(P>0.05).

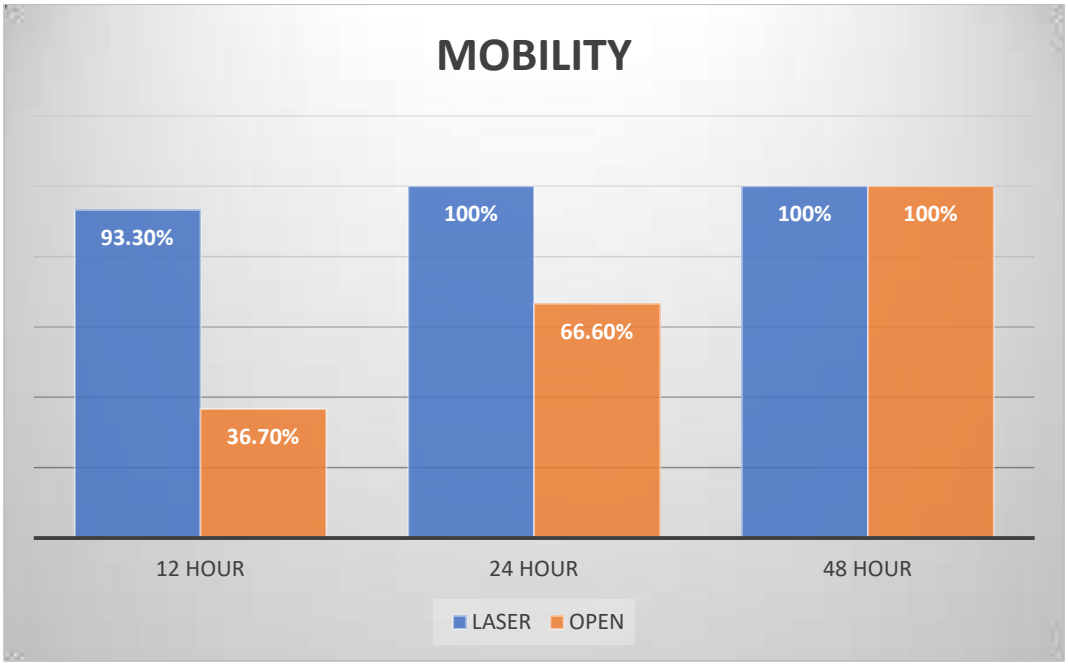

Figure 13: Association between Type of surgery and Mobility At Durations

DURATION OF SURGERY:

Duration of surgery was calculated from the time of incision till placement of anal pack.

In group A , the mean duration of surgery was found to be 30-40 minutes for a single hemorrhoid column.

In group B ,the mean duration of surgery was found to be 10-15 minutes for a single hemorrhoid column.

Table 5: Comparison of Mean Durations of different type surgery

Parameter	TYPE OF SURGERY	N	Mean	Std. Deviation	T Test	P Value	Result
DURATION OF SURGERY	Laser	30	12.13	5.835	-10.655	<0.001	Highly Sig
	Open	30	34.07	7.071			

The above table shows the comparison of Mean Duration of Surgery between Laser and open.

Independent t test for comparing the mean value between two different types of surgery was applied, which shows that there was significant difference in the mean Duration of Analgesia, Duration of Surgery & Hospital Stay values. (P<0.05)

In the case of duration of surgery, the mean value was found to be 16.23 minutes for Laser Type of surgery which was significantly lower than the mean value of 34.07 minutes for Open Type of surgery (P<0.05).

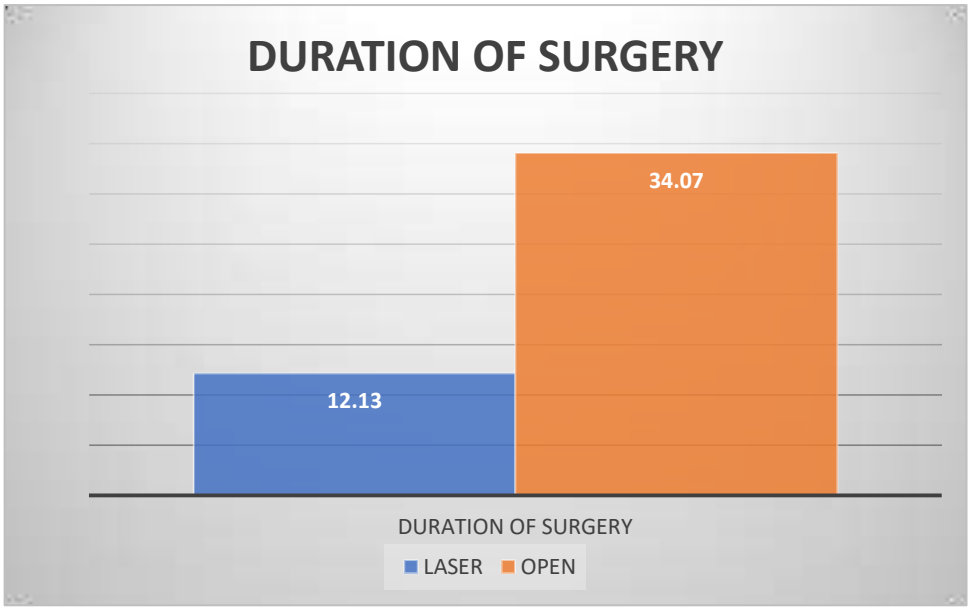

Figure 14: Comparison of Mean Durations of different type surgery

RETURN TO WORK:

The return to suitable work within the medical limitations of an injured worker who has not yet fully recovered from his/her injuries and is not yet able to return to his/her original job but who is capable of some form of employment

In group A , the mean duration for return to work was observed to be 5-6 days

In group B , the mean duration for return to work was observed to be 14-15 days

It is significantly seen that laser group had returned to work much earlier than those who had undergone open hemorrhoidectomy and found to be statistically significant

Table 6: Comparison of Mean Return to Work Between Type of surgery

Parameter	TYPE OF SURGERY	N	Mean	Std. Deviation	T Test	P Value	Result
RETURN TO WORK	Laser	30	5.67	1.605	-11.305	<0.001	Highly Sig
	Open	30	14.87	4.158			

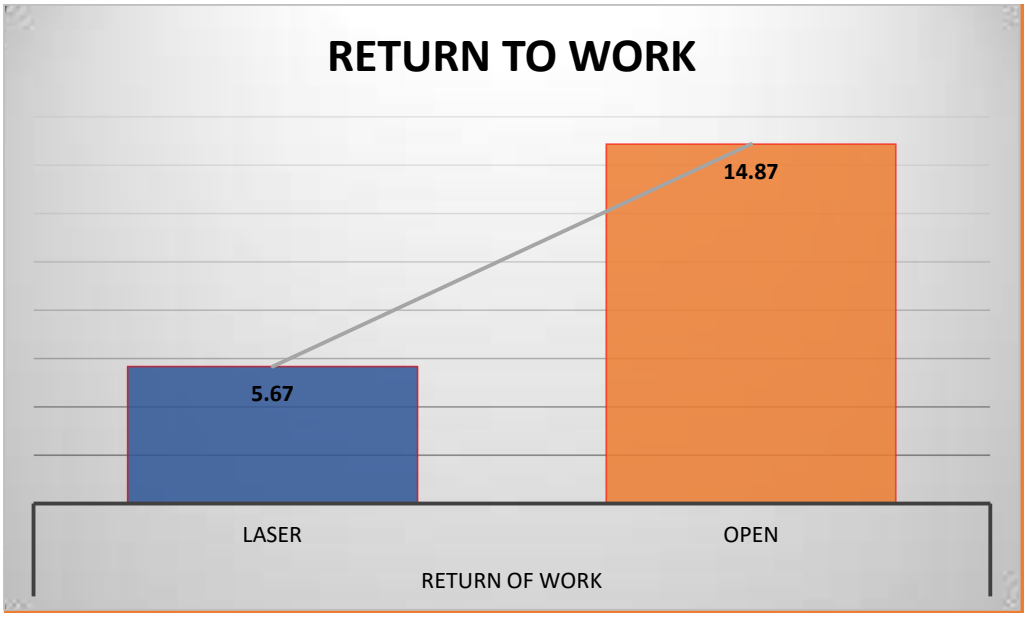

Figure 15: Comparison of Mean Return to Work Between Type of surgery

The above table shows the comparison of Mean Return of Work value between two different Type of surgery.

The Independent T test comparing the mean values between two different types of surgery was applied, which shows that there was significant difference in the mean Return of Work value between two groups. ($P<0.05$)

The mean value 5.67 for Laser Type of surgery was significantly lower than the mean value 14.87 for Open Type of surgery. ($P<0.05$)

Discussion

Age/Gender

To determine the significance of the age/sex in relation to the type of surgery in this study . There was no significant association with the type of surgery and the age/gender of the patient.

In Laser group, the maximum incidence of haemorrhoids occurred within the age group of 30-40 years followed by 50-60years, <30yrs, 60-70years, 40-50years and 70-80yrs .Similarly for Open type of surgery, the maximum incidence occurred within the age group of 40-50 years followed by 30-40 & 60-70 , 50-60 years & 70-80 years and <30yrs .A study by Wesam Nuri Yahya et al suggests Age was distributed as 36.03 ± 7.32 for laser and 35.73 ± 8.39 years for open with no significant difference between both groups which is similar to our study.

ASSOCIATION BETWEEN MEAN PAIN SCORE AND TYPE OF SURGERY

Post operative pain was evaluated using visual analogue scale at 12 ,24,48 hours in both open and laser group of surgery. It was observed that laser hemorrhoidoplasty (group B) had a significant less VAS mean score over the conventional open haemorrhoidectomy(group A) and found to be statistically significant p-value(<0.05).Post operatively both groups were given injection DOLO 1 gm as analgesia. Rescue analgesia Inj tramadol (2ml =100 mg) was given to patients whose VAS score > 5..However study by Anshuman Kaushal et al 38shows vas score significant at 12 hr mean(2.64) and for open (4.76) is and 24 hr mean was 1.88 and 3.6 was significant whereas at 1 week and months was not significant.

ASSOCIATION BETWEEN BLEEDING AND TYPE OF SURGERY

Our study shows that association between type of surgery and bleeding at different durations was found to be significant at, 12 Hrs and 24 hrs (P<0.05) & non-significant at 48 and 72 hrs (P>0.05) Post operative bleeding was evaluated using staining of gauze pack at 12 ,24,48 hours post-surgery and replacement was done using a fresh gauze pack. It was observed that open group of surgery had a significant amount of bleeding at 12,24 hours than the laser group of surgery and found to be statistically significant. During 48 hours , bleeding was not significant in both the groups of surgery and found to be statistically insignificant. which was found to be similar to study by **Aseem Trikha et al** [37]

ASSOCIATION BETWEEN MOBILITY AND TYPE OF SURGERY

Post operative mobility was observed at 3 different durations (12,24,48 Hours).At 12 ,24 hours patients who had undergone laser hemorrhoidoplasty had better ambulation than open haemorrhoidectomy procedure and the p-value was found to be statistically significant p-value (<0.05). At 48 hours, both group A and B were ambulating and had no complaints. The p-value was found to be insignificant.

ASSOCIATION BETWEEN TIME DURATION AND TYPE SURGERY

Duration of surgery in our study was measured in minutes , Duration of surgery was calculated from the time of incision till placement of anal pack.In group A , the mean duration of surgery was found to be 30-40 minutes for a single hemorrhoid column.In group B ,the mean duration of surgery was found to be 10-15 minutes for a single hemorrhoid column however study by Hosni **Mubarak Khan et al**[39] , observed that the mean value was 23.2±1.9 for Laser Type of surgery which was significantly lower than the mean value 34.3 ±5.5 for Open type of surgery. (P<0.05)

ASSOCIATION BETWEEN RETURN TO WORK AND TYPE OF SURGERY

The return to suitable work within the medical limitations of an injured worker who has not yet fully recovered from his/her injuries and is not yet able to return to his/her original job but who is capable of some form of employment .In group A , the mean duration for return to work was observed to be 5-6 days. In group B , the mean duration for return to work was observed to be 14-15 days .It is significantly seen that laser group had returned to work much earlier than those who had undergone open hemorrhoidectomy and found to be statistically significant.Our study shows that there was significant difference in the mean

Return of Work value between two groups. (P<0.05) however study by **Aseem Trikha et al** [37] there was significant difference in the number of days it took for the patients to return to work. With mean of 7.69+/-3.24 for laser and 21.87+/-4.16 for open group.

Figure 16:Laser haemorrhoidoplasty equipment

Figure 17: Pre op

Figure 18:Haemorrhoids grade 2

Figure 19: Holding at the perianal skin with allis tissue holding forceps

Figure 20:Placement of ice glove

Figure 21: Ice glove inserted(Time period 8-10 minutes)

Figure 22: Laser fibre introduced at the muco-cutaneous junction

Figure 23:POST OP IMAGE (Reduction in the size of the haemorrhoid can be appreciated)

CONCLUSION

Based on the detailed analysis of the provided data, several important conclusions can be drawn regarding the comparative outcomes of laser versus open surgeries. The study indicates that there is no significant difference in the age and sex distribution between patients undergoing laser and open surgeries, suggesting that demographic factors do not influence the choice of surgical method. However, the clinical outcomes highlight significant differences favouring laser surgery.

Patients who underwent laser surgery experienced significantly lower rates of post-operative bleeding and discharge within the first 48 hours compared to those who underwent open surgery. This indicates that laser surgery is less invasive and associated with fewer immediate complications.

The study also found that patients who underwent laser surgery had significantly higher mobility at 12, 24 hours post-operation and a shorter duration of hospital stay. This suggests that laser surgery allows for a quicker return to normal activities and reduces the burden on healthcare facilities. Additionally, laser surgery patients reported significantly lower pain scores at 12, 24, 48 hours post-operation, which can contribute to overall patient satisfaction and comfort.

In terms of clinical parameters, laser surgery patients had higher mean haemoglobin and platelet counts post-operation, indicating less blood loss and a more favourable recovery. The time to return to work was also significantly shorter for laser surgery patients, highlighting the economic and social benefits of this surgical method.

Overall, the findings of this study suggest that laser surgery offers several advantages over open surgery, including lower rates of post-operative complications, shorter hospital stays, less pain, and a quicker return to normal activities. These benefits make laser surgery a preferable option for patients and healthcare providers when considering surgical interventions.

SUMMARY

The comparative analysis between laser and open surgeries reveals several critical insights favouring the laser technique. Both surgical methods were applied to patients with similar age and sex distributions, ensuring that the observed differences in outcomes are attributable to the surgical techniques rather than demographic factors.

- Post-Operative Complications: Laser surgery patients experienced significantly lower rates of bleeding within the first 48 hours post-operation compared to those who underwent open surgery. Pain scores were significantly lower at 12-, 24 ,48hours post-operation for laser surgery patients, contributing to better post-operative comfort and satisfaction.
- Recovery and Mobility: Patients who underwent laser surgery had higher mobility at 12 hours post-operation and experienced shorter hospital stays, suggesting a quicker recovery process.
- Clinical Parameters: Higher mean hemoglobin and platelet counts post-operation in laser surgery patients indicate less blood loss and a more robust recovery. The time to return to work was significantly shorter for patients who underwent laser surgery, underscoring the economic and social benefits of this method.
- Overall, the findings suggest that laser surgery provides several advantages over open surgery, including fewer immediate post-operative complications, quicker recovery, and reduced pain. These benefits highlight laser surgery as a preferable option for patients and healthcare providers when considering surgical interventions.

By implementing these suggestions, the healthcare system can enhance surgical outcomes, improve patient experiences, and potentially reduce overall healthcare costs through the benefits associated with laser surgery.

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ANNEXURE

KAHERs JNMC

BELAGAVI

INFORMED CONSENT FORM

"A STUDY OF POST OPERATIVE OUTCOMES OF LASER HEMORRHOIDOPLASTY VS CONVENTIONAL OPEN HEMORRHOIDECTOMY"

Name of Student/Principal Investigator _____
Name of Guide/Co Investigators: _____

Objective

To compare the post operative outcomes following laser haemorrhoidoplasty and open haemorrhoidectomy.

The variables that are being compared are

- Post operative pain
- Complications such as bleeding
- Length of hospital stay
- Recurrence of disease within 3 months
- Post operative mobility
- Return to work
- Duration of surgery

Introduction

Haemorrhoids is considered as a very common anorectal condition. It affects millions of people around the world and considered as a major socioeconomic problem. Haemorrhoids is a familiar cause of admission to surgical clinics

The diagnosis of haemorrhoids was based on full history, proper clinical examination and evaluation of routine laboratory investigations

Bleeding is the early symptom of haemorrhoids. Very rarely, the bleeding maybe sufficient to cause anaemia. Pain is not commonly associated with bleeding and its presence

should make the clinician alert to the possibility of other diagnosis; however, pain may result from congestion of pile masses below a hypertrophic sphincter. The patient may also complaints of prolapse and anal irritation which may occur because of mucus secretion from the caudally displaced rectal mucosa, minor leakage through a now imperfect anal seal or difficulties in cleaning after defecation because of irregularity of anal verge.[1] There are many treatments of haemorrhoids varying from medication and band ligation to haemorrhoidopexy, laser photocoagulation, sclerotherapy, doppler guided artery ligation and finally surgery

Postoperative pain is the most common trouble with the open surgery. The other early complications are urinary retention, haemorrhage, and abscess formation. The long-term complications include anal fissure, anal stenosis, stool incontinence, perianal fistula, and recurrence of the disease. Intrahemorrhoidal laser coagulation or laser hemorrhoidoplasty was first described in 2009 giving rise to numerous advantages such as easy and efficient application and non-invasive non-toxic painless in nature.

In addition to the reduction of the pharmaceutical drugs, drug interactions and their side effects. Hence there is a need for the study to establish a comparison between laser haemorrhoidoplasty and open haemorrhoidectomy.

Explanation of procedure

Group A: Conventional Open haemorrhoidectomy

A V-shaped incision made in the skin surrounding the base of the haemorrhoid. Dissection in the submucous space done by cautery to strip the haemorrhoid from its bed. The dissection continued in the cranial direction up to the pedicle. The pedicle was then ligated with a 2/0 vicryl suture, and the distal part of the haemorrhoid excised. Same steps to be carried out regarding the other haemorrhoids, leaving a skin bridge between them to avoid complication such as anal stenosis. The wounds left open, light dressing with topical sucralime ano cream and a gauze left in the anal canal. The time of the operation recorded in minutes.

Group B: Laser hemorrhoidoplasty

The laser procedure performed using the (lasotronix laser) and start with proper per rectal examination in lithotomy position. A dedicated side viewing proctoscope (23 mm in diameter) was inserted in the anal canal. The procedure starts via small incision at the muco cutaneous junction (white line of Hilton). At the base of each haemorrhoid the laser fibre to be introduced into the hemorrhoidal plexus taking into consideration that the fibre should be parallel to the anal canal to avoid injury or burn of the mucosa or internal sphincter. Using a 1470 nm diode laser, before activation of laser fibre, we must wear antiglare glasses. The depth of shrinkage can be controlled by the power and duration of the laser beam. Through the optic fibre, laser shots were generated at a power of 6 W with duration of 3 s each shot followed by a pause of 0.5 s causing shrinkage of tissues up to the depth of 5 mm. During activation of the laser fibre rotatory motion in the caudal direction is done to prevent the adhesion of tissues. After the procedure ice finger is inserted for about 8-10 minutes and operation time is recorded in minutes and patient is shifted to recovery.

Withdrawal from participation in the study: Participation in this study is voluntary. You will be free to decide whether to participate in this study or continue participation once enrolled. In case you decide to withdraw your participation, you are free to do so. However, please convey the decision to the principal investigator.

Possible benefits from participating in the study: You will/will not have nor get any benefits by participating in this study. The data gathered will help the population at large.

Possible risks from participating in the study: There are no risks involved in participating in this study.

Privacy and confidentiality

The information collected from you will be coded, to prevent any person from identifying you. Your identity will never be revealed. The data collected from you will be kept confidential and only processed or aggregated data will be used for publication.

Financial incentives

You will not receive any payment for participating in this study. Authorization for publication of aggregated data: Results obtained after processing of the aggregated data will be published for scientific purposes and or presented to scientific groups. However, your identity will never be revealed.

Questions

In case of any questions about this study, you are free to contact: “Name of student/PI, mobile number, email ID” If you have any question or complaints about your right as study participant you may contact Dr Harsha Hegde, Chairperson, Ethical committee of JNMC, 0831-2473777 Extension 4052.

Legal rights

By signing this consent form, we are not waving any of legal rights.

CONSENT STATEMENT

I am making a voluntary decision to participate in the study "A STUDY OF POST OPERATIVE OUTCOMES OF LASER HEMORRHOIDOPLASTY VS CONVENTIONAL OPEN HEMORRHOIDECTOMY –A ONE YEAR PROSPECTIVE COMPARATIVE CLINICAL STUDY AT KAHERS DR. PRABHAKAR KORE CHARITABLE HOSPITAL AND MEDICAL RESEARCH CENTRE BELAGAVI 590010". My signature below indicates that I have decided to participate, and I have read the information provided above or the information provided above has been read to me in the language that I understand best. I was given the opportunity to ask questions and that they have been answered to my satisfaction.

Name of the participant:
Signature or thumb impression of participant:

Name of the witness:
Signature or left thumb impression:

Name of the investigator:
Signature of the investigator:

Case Proforma:

Comparative Analysis of Laser vs. Open Surgery Outcomes

Patient Information

- Name: [Patient's Name]
- Age: [Patient's Age]
- Gender: [Patient's Gender]
- Medical Record Number: [MRN]
- Date of Admission: [Date]
- Date of Surgery: [Date]

Pre-operative Assessment

- Diagnosis: [Diagnosis]
- Indication for Surgery: [Indication]
- Medical History:
    - Previous Surgeries: [Details]
    - Chronic Conditions: [Details]
    - Medications: [List of Medications]
- Allergies: [Details]
- Pre-operative Investigations:
    - Blood Tests: [Results]
    - Imaging: [Results]
    - Other Tests: [Details]

Surgical Details

- Type of surgery:
    - Laser Surgery
    - Open Surgery
- Surgeon: [Surgeon's Name]
- Anesthetist: [Anesthetist's Name]
- Duration of Surgery: [Time]
- Intra-operative Findings: [Details]
- Complications: [Details]

Post-operative Assessment

- Immediate Post-operative Complications:
    - Bleeding: [Yes/No, Details]
- Vital Signs Post-operation:
    - At 6 hours: [Details]
    - At 12 hours: [Details]
    - At 24 hours: [Details]
    - At 48 hours: [Details]
    - At 72 hours: [Details]
- Pain Assessment (0-10 scale):
    - At 12 hours: [Score]
    - At 24 hours: [Score]
    - At 48 hours: [Details]
    - At 72 hours: [Details]
- Mobility:
    - At 6 hours: [Able to move/Unable to move]
    - At 12 hours: [Able to move/Unable to move]
    - At 24 hours: [Able to move/Unable to move]

Hospital Stay

- Duration of Hospital Stay: [Days]
- Date of Discharge: [Date]

Follow-up

- First Follow-up Appointment: [Date]
- Condition at Follow-up: [Details]
- Return to Work: [Date]
- Long-term Complications: [Details]
- Recurrence within three months: [Yes/No]

Patient Satisfaction

- Overall Satisfaction (0-10 scale): [Score]
- Feedback: [Patient's comments]

name	age	sex	Ip No	CHIEF COMPLAINTS	PAST HISTORY	PER-RECTAL EXAMINATION	HB	WBC	PLATELET	SERUM CREATININE	UREA	PT/INR	PAIN ASSESEMENT 12 HR	24 HR	48 HR	BLEEDING AT 12 HR	24 HR	48 HR	MOBILITY AT 12 HR	24 HR	48 HR	48 HR	RETURN OF WORK	DURATION OF SURGERY	TYPE OF SURGERY
Sunita goture	50	F	1181187	c/o bleeding per rectum x 2 months difficalty in passing stools x 3 months	No significant	External Hemorrhoid @ 11'o clock position	12,7	7400	285000	0,9	40	0,98	5	4	2	+	+	-	no	yes	yes	yes	15th day	30 min	Open
Saroja S	43	F	1196847	c/o difficulty is passing stools x 6 months bleeding per rectum x 3 month pain during defication x 4 month inregular bowel habits x 6 months	k/c/o T2DM on Tab Glimipride 100 No other significant past history	External Hemorrhoid @ 9'o clock position Anal tone (n) grade III	11,8	6700	190000	1,1	40	0,9	7	5	3	+	+	-	no	no	yes	yes	12th day	35 min	Open
Arun somu chavan	31	M	10012720	Passage of hand stools x 4 month pain during defecation x 3 month bleeding per rectum x 1-2 month No other complaints	No significant	Grade II external Hemorrhoid @ 1' clock position	11,7	7600	216000	0,7	34	0,9	7	5	3	+	+	-	Yes	no	Yes	Yes	15th day	25 min	Open
Chidanand A	56	M	1141226	Bleeding per rctum of while passing stools x 6 month difficulty in passing stools x 8 months no other complaints	k/c/o t2DM - 10 yrs on insulin lispro 4-0-4 k/c/o HTN x 15 years tab amlong 25 mg Insulin glargin 0-16-0	External Hemorrhoid @ 3'o clock position Anal tone in reased	11,4	7600	270000	0,8	34	0,91	6	4	3	+	-	-	no	yes	yes	yes	15th days	35 min	Open
Raziya begamf	43	F	10016467	c/o difficulty in passing stools x 2-3 month pain during defecation x 2 month	k/c/o T2DM x 3 yrs on T mebformin 1-0-0 H/o Bectomy tone 4 yrs back	Grade 3 hemorrhoid + anal tone - n	12,4	7800	238000	1,07	30	0,6	6	5	2	+	+	-	no	yes	yes	yes	PoD - 10	30 min	Open
Krishna B	70	M	10005042	Bleeding per rectum x 4 5 month passing of hard stools x 1 yrs Painful defecation x 8 months	k/c/o T2DM on tab Dapagliflolin 20 mg 1-0-0 tab Hetformin 500 mg	Anal tone Grade III External hemorrhoid @ 9'o clock position	8,2	4500	237000	1,1	60	0,9	6	4	2	+	+	+	yes	no	yes	yes	10th day	25 min	Open
Vimla Malagovda	45	F	10011506	Bleeding per rectum x 2 month passing of hard stools x 4-5 month Painful defecation x 3 months	No significant	Grade II external Hemorrhoid @ 3' clock position	9,8	6230	245000	0,82	42	1,02	6	5	4	+	+	+	no	yes	yes	yes	15th day	30-35 min	Open
Chanappa B	64	M	11001446	bleeding per rectum x 1 month difficulty is passing stools x 3 months similar complaints 2 years back	c/c/o T2DM on regular medication tab Metformin 500mg 1-0-0	External Hemorrhoid @ 8'o clock, 7'o clock position grade III	9,3	7300	256000	1,12	34	1,07	7	4	3	+	+	-	no	yes	yes	yes	20th day	30 ± 5 min	Open
Sadik D	52	F	1099012	c/o Painful defecation x 2 month bleeding during defecation x 100 days	Not a k/c/o T2DM, HTN, Bronchial asthama, tb, epilepsy	Anal tone Grade III External hemorrhoid @ 3'o clock position	10,8	8500	250000	0,7	32	1,1	6	5	3	+	-	-	no	no	yes	yes	pod 14	25-30 min	Open
Sheela P	48	F	1208233	Passing of hard stools x 1 yr bleeding per rectum x 3-4 months painful defecation x 6 month	k/c/o T2Dm on regular treatment tab GLIHRPAIDE 20/500MG 1-0-0	Grade III external hemorrhoid @ 11'o clock position anal bone	10,7	6700	187000	1,1	40	0,87	7	5	4	+	+	-	no	no	yes	yes	20th day	35 min	Open
Gangadhar pujar	28	M	1181024	c/o bleeding per rectum x 2 months difficalty in passing stools x 3 months	no other known comorbidities klc/o brontical asthama x 4 yrs on ipravent	External Grade III hemorrhoid @ 7'o clock , 5'o clock	12,4	8300	285000	0,67	40	0,98	5	4	3	+	+	-	no	yes	yes	yes	15th day	35 min ±5 min	open
bhaskar mahadev	46	M	10045078	bleeding while passing stools x 3 month Difficulty is passing stools x 4 month	k/c/o Systmic hypertension on tab telma 40mg 1-0-0 no other comorbidities	External hemorrhoid @ 3'o clock position grade III	12,4	6400	285000	1,1	40	0,8	6	4	2	+	+	-	yes	yes	yes	yes	25th day	35±5 min	open
Veerabadraya V	70	M	1198348	c/o passage of hard stools x 6 months bleeding per rectum x 3 month	k/c/o T2DM - klclo HTN x 15 year on tab telma - D 40 mg and Tab DAPAGLIFLOZIN 1-0-0	External hemorrhoid @ 5'o clock position analtone	10,8	5800	220000	0,8	60	1,15	7	4	4	+	+	-	no	no	yes	yes	20th day	30 min	open
Shrishail sidagouda	74	M	10093074	Bleeding per rectum x 4 months difficulty in passing stools x 6 months	k/c/o T2DM - klclo HTN x 15 year on tab AMLONG 25 mg and Tab GLIMIPRIDE 20MG 0-0-1 Tab METFORMIN 500MG 1-0-0	External hemorrhoid + @ 7' o clock and 11'o clock position Grand III	9,4	6700	245000	1,07	34	1,15	7	4	3	+	+	-	yes	yes	yes	yes	15th day	35±5 min	Open
Rajasherhar A	60	M	1196834	Passing of hard stools x 8 month bleeding per rectum x 3 months	k/c/o T2DM - klclo HTN x 15 year on tab GLIMIPRIDE 1-0-0 no other known comorbidities	External hemorrhoid @ 5'o clock position	9,4	7800	147000	0,8	40	1,05	7	5	4	+	-	-	no	yes	yes	yes	17th day	35 min	Open
Revappa G	45	M	1180438	Bleeding per rectum x 2 month Painful defecation x 1 months	k/c/o T2DM on regular medication	External hemorrhoid Grade III @ 9'o clock	12,6	6400	184000	0,74	34	1,01	6	3	3	+	+	-	yes	yes	yes	yes	15th day	30 min ± 5 min	Open
sadashiv arabyanwadi	29	M	10014620	Painful defecation and Bleeding while passing stools x 4 months	No significant past history Not a k/c/o T2DM, HTN, Bronchial asthama, Tb, epilepsy	External Grade III hemorrhoid @ 11'o clock anal tone	9,8	7800	175000	0,96	36	1,05	6	3	2	+	+	-	yes	yes	yes	yes	10th day	35 min ± 5 min	Open
Madhukar K	68	M	1182667	Bleeding per rectum x 6 month Hass per rectum x 5 days	k/c/o HTN x 10 yr on tab LMLONG 2.5 MG 1-0-0 No other known comorbidities	External hemorrhoids @ 11'o clock position grade II	8,7	7300	215000	0,7	25	0,9	7	4	3	+	+	-	yes	yes	yes	yes	10th day	30 min ± 3 min	Open
ulavappa melavalkl	35	F	1188073	bleeding per rectum x 5days	No significant	External Hemorrhoid @ 7'o clock position	12,3	7300	195000	0,8	23	0,5	7	4	2	+	+	+	yes	yes	yes	yes	15th day	28min ±5min	open
anita patil	32	F	1100657	Bleeding per rectum x 2 month	No significant	External hemorrhoid @ 11'o clock position	8,7	8700	197000	0,6	28	1,02	6	3	2	+	-	-	yes	yes	yes	yes	25th day	30min ±5min	open
sidappa P	42	M	10004101	Bleeding per rectum x 3 month Difficulty is passing stools x 1 month	No significant	External hemorrhoid @ 11'o clock position grade II	10,8	6300	196000	0,6	40	1,12	6	4	2	+	+	-	yes	yes	yes	yes	20thday	25min ±5min	open
Shrikanth Kamalpur	40	M	10005831	c/o bleeding per rectum x 2 month c/o mass per rectum x1 month	nil significant	External hemorrhoid @ 11'o clock position	11,4	7300	185000	1,01	26	0,98	7	4	2	+	-	-	no	yes	yes	yes	15 th day	35 min	Open
anand K	39	M	10002384	bleeding per rectum x 2 weeks	nil significant	External hemorrhoid @ 11'o clock position	11,7	7200	135000	1,02	40	0,98	6	4	2	-	-	-	no	no	yes	yes	11th day	30 min ± 5 min	Open
Khadisha G	59	M	10034581	bleeding per rectum x 1 month	No known comorbdities	External hemorrhoid @ 11'o clock position	11,2	7200	185000	1,12	40	0,9	7	5	4	+	+	-	No	no	yes	yes	12th day	31 min ± 5 min	Open
Bhimappa Kolarv	65	M	10034534	c/o bleeding per rectum x 2 month c/o mass per rectum x1.5 month	nil significant	External hemorrhoid @ 11'o clock position	10,9	8200	195000	1,07	24	2,02	7	5	4	-	+	-	no	yes	yes	yes	15th day	32 min ± 5 min	Open
omprakash D	45	M	10065987	c/o bleeding per rectum x 2 month c/o mass per rectum x1 month	No known comorbdities	External Hemorrhoid presentat @ 3'o clock, 5'o clock Position	12,2	6900	179000	1,01	24	0,65	6	3	2	+	-	-	no	yes	yes	yes	13th day	25 min ± 5 min	Open
anand samrth	67	M	10066033	Bleeding per rectum x 2 month Difficulty in passing stools x 2 weeks	k/c/o T2DM x 15 year or tab GLIMIPRIDE 20 MG 1-0-0	External Hemorrhoid presentat @ 11'o clock Position	13,2	6200	189000	1,01	26	0,89	6	4	2	+	-	-	no	yes	yes	yes	10th day	25min ±2min	Open
Balarajan V	70	M	10042225	Bleeding per rectum x 4 month Difficulty in passing stools x 2 weeks	No known comorbdities	External Hemorrhoid presentat @ 7'o clock Position	12,4	7600	156000	0,5	26	0,82	7	4	2	+	-	-	no	no	yes	yes	12th day	30 min ± 5 min	Open
abhijit K	19	M	1199403	Passage of harde stools x 1 week constipation x 2 week and bleeding per rectum x 1 weeks	No significant / No known comorbdities	External Hemorrhoid presentat @ 3'o clock Position	11,2	7400	165000	1	26	0,95	6	4	2	+	-	-	no	yes	yes	yes	17th day	30 min ± 5 min	Open
kallappa O	31	M	10066533	Passage of harde stools x 4 month bleeding per rectum x 1 -2 month pain during defecation x 3 month	no significant	External hemorrhoids present @ 1 clock position	11,7	7600	216000	0,7	34	0,9	6	5	3	+	+	+	yes	no	yes	yes	15 day	25 min+/- 8 min	Open

name	age	sex	Ip No	CHIEF COMPLAINTS	PAST HISTORY	PERRECTAL EXAMINATION	HB	WBC	PLATELET	SERUM CREATININE	UREA	PT/INR	PAIN ASSESEMENT 12 HR	24 HR	48 HR	BLEEDING AT 12 HR	24 HR	48 HR	MOBILITY AT 12 HR	24HR	48HR	Return to work	DURATION OF SURGERY	TYPE OF SURGERY
Pradeep Kamble	33	M	1187060	c/o bleeding per rectum x 1 month Difficulty is pasing	No significant past history	Anal tone inused graccle 2	12,6	7600	235000	1,1	30	1,07	5	3	1	-	-	-	yes	yes	yes	5	10-15 min	Laser
Sultan Madarshi	80	M	1173307	Passage of hand stools x 6 months bleeding per rectum	k/c/o T2DM x 15 yrs on regular	External hemorrhoids @ 7	11,7	6700	157000	1,1	40	0,89	4	2	1	-	-	-	yes	yes	yes	6	15 min	Laser
Vishal C	30	M	10021831	c/o bleeding while passing stools x 3 months difficulty	No known comorbidities	External hemorrhoids @ 11	13,4	7400	239000	0,7	20	1,01	3	1	0	-	-	-	yes	yes	yes	5	12 min ± 2 min	Laser
Jayavant Hungeri	50	M	1165325	bleeding while passing stools / Difficulty is passing stools x	k/c/o HTN - kl c/o T2DM - 10 yrs on	External Hemorrhoid @ 5'o clock position	12,4	6400	234000	1,1	30	1,05	4	2	1	-	-	-	yes	yes	yes	5	10 min ± 2 min	Laser
Shivanand W	23	M	1163426	Bleeding per rectum x 2 month Difficulty in passing stools x 3 months	No known comorbidities	External hemorrhoid @ 3'o clock	12,4	6300	258000	1,1	34	1,01	3	2	1	-	-		yes	yes	yes	5	10 min	Laser
Adiveppa S	30	M	1173597	Bleeding per rectum x 6 month Difficulty in passing stools x 12 months	inguinal hemorrhoidoplast y 30 yrs back k/c/o T2DM, HtN - 10 yrs on regular medication	External hemorrhoid + @ 3'o clock 7'o clock	9,2	7300	237000	1,07	40	0,98							yes	yes	yes	5	10 min	Laser
Basavaraj Gondalabil	29	M	1165480	Passage of hand stools x 2 months bleeding per rectum x 15 months	No known comorbdities	External Hemorrhoid @ 11'o clock position	13,7	6700	218000	0,8	40	0,89	4	2	1	+	-	-	no	yes	yes	6	10 min	Laser
Sideshwar K	30	M	10016084	Bleeding per rectum x 2 month Difficulty in passing stools x 4 months	No significant past history	External Hemorrhoid @ 11'o clock position	13,5	7900	295000	0,86	40	0,9	4	2	1	-	-	-	yes	yes	yes	6	15 min ± 2 min	Laser
Manjula K	50	F	10028117	c/o bleeding while passing stools x 1 months difficulty is passing stools x 2 month	no known comorbidities	External Hemorrhoid @ 11'o clock position shin tag @ 4'o clock , 6'o clock position	12,7	7200	275000	1,05	38	0,67	3	1	1	-	-	-	yes	yes	yes	5	12 ± 2 min	Laser
Ashok L	55	M	10016081	Bleeding per rectum x 4-5 month Difficulty in passing stools x 6 months	k/c/o Type II DM x 10 days on tab metformin 500 mg 10 days	External Hemorrhoid @ 7'o clock position	12,4	7350	240000	0,8	40	0,9	5	2	1	-	-	-	yes	yes	yes	4	15 min ± 2 min	Laser
Laxmavva N	51	F	10051230	Bleeding per rectum x 3 month Difficulty in passing stools x 6 months	No known comorbdities	External hemorrhoid @ 3'o clock				0,9	34	1,15	3	2	1	-	-	-	yes	yes	yes	5	12 min ± 2 min	Laser
Jayaram M	60	M	1184973	c/o bleeding while passing stools x 1 months difficulty is passing stools x 2 month	no known comorbidities	External Hemorrhoid @ 11'o clock position shin tag @ 4'o clock , 6'o clock position	12,5	7270	265000	1,02	39	0,77	3	1	1	-	-	-	yes	yes	yes	6	13 ± 2 min	Laser
Virupaksha C	43	M	1196532	c/o difficulty is passing stools x 4 months bleeding per	k/c/o Hyupertension x 4	External Hemorrhoid @ 5'o clock position	10,4	7600	125000	0,9	40	1,05	4	3	2	-	-	-	yes	yes	yes	6	10-12 min	Laser
Shivprasad P	45	M	10021735	Bleeding per rectum x 2 mont	no other know comorbidities	External hemorrhoid @ 7'o clock	11,2	4200	210000	1,02	40	0,87	3	1	1	-	-	-	Yes	yes	yes	4	13 ±2 min	Laser
Prakash G	55	M	11007864	Bleeding per rectum x 3 mont	k/c/o T2DM - klclo HTN x 5 year on regular medication k/c/o T2DM x 5 year on tab Tab METFORMN 500 MG 1-0-0	External hemorrhoid @ 3'o clock position Grade II	11,5	7300	215000	1,01	40	0,98	4	1	0	-	-	-				5	10 ± 2 min	Laser
Pavadeppa k	30	M	1182666	Bleeding per rectum x 1 mont	k/c/o HTN x 2 year on posittion	External hemorrhoids @ 3'o clock position grade II	13	6000	300000	0,86	30	1	4	1	0	-	-	-	yes	yes	yes	5	12 ± 2 min	Laser
Anusha L	19	F	1182098	c/o bleeding per rectum x 20	No known comorbdities	External hemorrhoids @ 3'o clock postion grade II	11,5	10000	300000	1	16	0,76	4	0	0	-	-	-	yes	yes	yes	5	15 min ± 2 min	laser
Bahubali patil	52	M	1185885	c/o bleeding while passing sto	k/c/o HTN x 7 year on posittion	External Hemorrhoid @ 11'o clock position grade II	11	9200	310000	0,8	20	1	5	1	1	-	-	-	yes	yes	yes	6	12 min ± 2 min	laser
Rekha W	48	F	1182905	bleeding per rectum x 4 mont	k/c/o HTN x 8 year on posittion	External Hemorrhoid @ 7'o and 11'o clock position grade II	12	11000	205000	1	16,4	0,96	4	0	0	-	-	-	yes	yes	yes	5	12 ± 2 min	Laser
Sunil naik	24	male	1183110	Bleeding per rectum x 6 mont	k/c/o Hyupertension x 2 yrs on tab	External Hemorrhoid presentat 7 @ clock Grade III	12	11000	294000	0,88	22	1,12	6	2	3	-	-	-	yes	yes	yes	5	18min ± 2min	Laser
Chandrakanth P	65	M	1182657	Bleeding per rectum x 3 mont	k/c/o T2DM on t netformin x 10 yrs	External Hemorrhoid presentat 7 @ clock Grade III	10,5	7800	280000	1,2	18	1,285	5	0	0	-	-	-	yes	yes	yes	5	10 min ± 5 min	Laser
Shivanand samarth	17	M	1185865	Bleeding per rectum x 6 mont	No known comorbdities	External Hemorrhoid presentat @ 3'o clock Grade III	11,8	90000	276000	0,88	23,6	1,07	5	1	1	-	-	-	yes	yes	yes	6	12 min ± 2 min	Laser
Dinesh K	50	M	10022378	Bleeding per rectum x 3 mont	no known comorbdities	External Hemorrhoid presentat @ 3'o clock Grade III	11,3	9000	278000	0,92	24,8	1,06	5	1	1	-	-	-	yes	yes	yes	6	13 ±2 min	Laser
Suresh arjun	60	M	10065209	bleeding per rectum x 2 year	k/c/o HTN x 3 year or Tab AMLONG 5 MG 1-0-0	External Hemorrhoid presentat @ 3, 7 and 11 'o clock position Grade III	13	6000	300000	1,06	37	1,01	4	2	2	+	-	-	yes	yes	yes	5	20 min ± 2 min	Laser
Gajanan R	29	M	10097471	Bleeding per rectum x 1.4 yea	No known comorbdities	External Hemorrhoid presentat @ 7'o clock and '11o clock Position	13,3	11000	281000	0,98	38	1,01	5	3	1	-	-	-	yes	yes	yes	4	16 min ± 2min	Laser
Bhimappa Yallapa	32	M	10022457	Bleeding per rectum x 4 mont	K/c of type 2 Dm , HTN x 15 years	external hemorrhoid @ 11'o clock position and 9' o clock position	11	4500	210000`	1,01	37	0,9	5	2	2	+	+	+	no	yes	yes	4	15 min ± 2min	laser
Pradeep K	34	M	10065229	c/o bleeding per rectum x 1 month Difficulty is pasing stools x 3 month	No significant past history	Anal tone in used graccle 2 prostatomegaly	11,6	7000	205000	0,9	35	1,05	5	4	1	-	-	-	yes	yes	yes	4	15 mints ± 5 mints	laser
Aravindh K	32	M	10065269	Bleeding per rectum x 8 mont	No known comorbdities	External Hemorrhoid @ 5'o clock position	12,7	6600	345000	0,8	28	0,9	4	3	1	-	-	-	YES	YES	YES	4	12 mints ± 3 mints	laser
Umesh K	70	M	10042226	bleeding per rectum x4 mont	No known comorbdities	externahemorrhoid @ 7' o clock position grade 3	12,4	7600	156.000	0,5	26	0,82	4	2	2	+	-	-	yes	yes	yes	5	10 mints ± 5 mints	laser