Section: General Surgery

Original Research Article

OPEN HAEMORRHOIDECTOMY VERSUS INJECTION SCLEROTHERAPY IN MANAGEMENT OF GRADE II AND GRADE III HAEMORRHOIDS: A COMPARATIVE STUDY

Erabati Santosh Raja[1], Tetali Sri Satya Sai Rama Reddy[2]

[1]Associate Professor, Department of General Surgery, Gitam Institute of Medical Science and Research, Visakhapatnam, Andhra Pradesh, India.
[2]Junior Resident, Department of General Surgery, Gitam Institute of Medical Science and Research, Visakhapatnam, Andhra Pradesh, India

Received : 19/02/2025
Received in revised form : 03/05/2025
Accepted : 21/05/2025

Keywords:
Haemorrhoids, Sclerotherapy, Haemorrhoidectomy, Sodium Tetradecyl Sulfate, Anorectal Surgery.

Corresponding Author:
Dr. Erabati Santosh Raja,
Email: drerabatisantoshraja12@gmail.com

DOI: 10.47009/jamp.2025.7.3.80

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2025; 7 (3); 415-421

ABSTRACT

Background: Haemorrhoids are a common anorectal condition with significant morbidity. Grade II and III haemorrhoids can be managed via surgical or non-surgical modalities. This study compares the effectiveness, complications, and outcomes of open haemorrhoidectomy versus injection sclerotherapy. **Materials and Methods**: A prospective comparative study was conducted on 64 patients with grade II and III haemorrhoids. Patients were randomized into two groups: 32 underwent open haemorrhoidectomy and 32 received injection sclerotherapy using sodium tetradecyl sulfate. Parameters such as pain, bleeding, urinary retention, recurrence, and duration of hospital stay were evaluated over a 6-week follow-up period. **Result**: Both groups were comparable in age, sex, and grade of disease. Pain and postoperative bleeding were significantly higher in the haemorrhoidectomy group in the first two weeks. Hospital stay and procedural time were also significantly longer in the surgical group. Recurrence rates were low and not statistically different between the two groups. **Conclusion**: Injection sclerotherapy is a safe, effective, and less morbid outpatient procedure for managing grade II and III haemorrhoids. Open haemorrhoidectomy, though associated with greater pain and longer recovery, remains a definitive treatment in select cases or in recurrence.

INTRODUCTION

Hemorrhoidal disease (HD) is defined as the symptomatic enlargement and/or distal displacement of anal cushions.[1] Hemorrhoids are therefore the pathological term to describe the abnormal downward displacement of the anal cushions causing venous dilatation. There are typically three major anal cushions, located in the right anterior, right posterior, and left lateral aspect of the anal canal, and various numbers of minor cushions lying between them.[2] Globally, the incidence ranges from 50 to 80%, and in India, it affects around 75% of the population. Hemorrhoids generally have the peak prevalence at the age of 45–65 years and affects both the genders. Hemorrhoids are one of the most common proctological diseases.[3] The main complaints are bleeding during or after defecation, anal pain, itching, prolapse, and perianal soiling.[4] Although hemorrhoids are recognized as a very common cause of rectal bleeding and anal discomfort, the true epidemiology of this disease is unknown because patients have a tendency to use self-medication rather than to seek proper medical attention. The definite diagnosis of HD is based on precise patient history and careful clinical examination. Assessment should include a digital rectal examination and anoscopy in the left lateral position. Treatment options available are dietary and lifestyle modification, medical treatment, sclerotherapy radiofrequency ablation, rubber band ligation, and operative intervention (open/close or stapler hemorrhoidectomy).[5]

Haemorrhoids are vascular structures in the anal canal that help with continence but become pathological when swollen or inflamed. They are classified into four grades, with grade II and III often requiring interventional treatment. Injection sclerotherapy and open haemorrhoidectomy are two widely used treatment modalities. This study aims to compare these two approaches in terms of efficacy, complications, and overall outcomes.

MATERIALS AND METHODS

This study was done in the department of General Surgery of Gitam Institute of Medical Sciences and Research(GIMSR). All the symptomatic patients of

ISSN (O): 2687-5365; ISSN (P): 2753-6556

grade 2 and 3 haemorrhoids were included and taken in the study. Informed consent is taken from all the patients. Study was conducted over a period of 18 months from 1/11/2022 to 30/4/2024 after obtaining institutional ethics committee clearance. Patients in this conducted study were randomized into two groups where one group is treated with open haemorrhoidectomy and other group treated by injection sclerotherapy using sodium tetradecyl sulphate.

Group A (n=32): Underwent open haemorrhoidectomy under spinal anaesthesia. Group B (n=32): Received outpatient injection sclerotherapy using sodium tetradecyl sulfate.

Inclusion Criteria: All adult patients >18 years diagnosed with grade 2 and grade 3 haemorrhoids.

Exclusion Criteria: Patients with concurrent fissure in ano/fistula in ano, with recurrent haemorrhoids, with portal hypertension.

Open haemorrhoidectomy needs preparation of the patient I.e bowel preparation ,parts preparation and is done on IP basis. Injection Sclerotherapy needs no preparation of the patient and this procedure can be carried out on OP basis.

Open haemorrhoidectomy-instruments are proctoscope, monopolar/bipolar cautery devices, mayo scissors, allis forceps,blade with BP handle, light source. Injection Sclerotherapy-instruments used are proctoscope, long spinal needle(25G), 2ml sodium tetradecyl sulphate, light source.

Both the procedures were done with patient in lithotomy position.

Open haemorrhoidectomy: in an OT table,under spinal anaesthesia ,in lithotomy position ,parts painted and draped. Haemorrhoidal mass was identified and were held with allis tissue holding forceps and skin, adjacent anal mucosal strip with haemorrhoidal plexus is excised after transfixing the pedicle with absorbable sutures. Anal pack placed.

Injection Sclerotherapy: it was done with setrol(sodium tetradecyl sulphate) sclerosant. It is loaded in 2ml syringe. Using proctoscope in a good light,pile mass was seen and sclerosant solution is injected into pile mass.congestion of the pile mass was noticed after giving injection. Following both the procedures, all the patients are monitored in post operative period.

Demographic data of the patients were collected. Grades of haemorrhoids at presentation also noted. patients were followed up post-procedure biased on following variables. Patients were followed up at 1,2,4 and 6 weeks. And is assessed based on duration of procedure, urine retention, pain score(visual analog scale), bleeding per rectum,post operative wound discharge, recurrence and duration of hospital stay.

RESULTS

Table 1: Demographic details of patients

Grade	Injection Group	Open Group	Total
2	16	16	32
3	16	16	32
TOTAL	32	32	64
Gender			
Female	14	12	26
Male	18	20	38
Complaints			
Anal Pain	5	6	11
Bleeding	20	15	35
Constipation	2	5	7
Prolapse	5	6	11

There is no significant variation in mean age in between groups. Mean age was 41.3 years in injection group and 39 years in open group. There is no significant variation in gender in between groups. Overall 38 patients were males, 26 patients were females. There is no significant variation in the chief complaint in between groups. 35 patients complained of bleeding.

Table 2: Pain during follow up weeks

Pain during 1st week	Injection Group	Open Group	Total
No	19	8	27
Yes	13	24	37
Pain during 2nd week			
No	27	26	53
Yes	5	6	11
Pain during 4th week			
No	29	30	59
Yes	3	2	5
Pain during 6th week			

ISSN (O): 2687-5365; ISSN (P): 2753-6556

No	31	32	63
Yes	1	0	1

There is significant variation in the presence of pain. Overall 37 patients had pain during 1st week. It was more commonly seen among open group of patients
There is no significant variation in presence of pain during 2nd week. Overall 11 patients had pain during 2nd week. There is no significant variation in presence of pain. Overall 5 patients had pain during 4th week. There is no significant variation in presence of pain at 6th week. 1 patient had pain finally during 6th week.

Table 3: Urine retention in present study

Urine Retention	Injection Group	Open Group	Total
NO	22	27	49
YES	10	5	15
TOTAL	32	32	64

Urine retention was seen among 15 patients overall and 10 patients among them belonged to the injection group but there is no significant variation in the incidence of urine retention.

Table 4: Bleeding during followup weeks

Bleeding during 1st week	Injection Group	Open Group	Total
No	24	9	33
Yes	8	23	31
Bleeding during 2nd week			
No	30	17	47
Yes	2	15	17
Bleeding during 4th week			
No	32	30	62
Yes	0	2	2

There is significant variation in presence of bleeding during 1st week in between groups. Overall 31 patients had bleeding and 23 belonged to the open group.
There is significant variation in presence of bleeding during 2nd week in between groups. Overall 17 patients had bleeding and 15 belonged to the open group.
There is no significant variation in presence of bleeding during 4th week. Overall 2 patients had bleeding and 2 belonged to the open group.

Table 5: Constipation during followup weeks

Constipation during 1st week	Injection Group	Open Group	Total
No	27	30	57
Yes	5	2	7
Constipation during 2nd week			
No	31	32	63
Yes	1	0	1
Constipation during 4th week			
No	32	30	62
Yes	0	2	2

There is no significant variation in constipation incidence during 1st week. It was seen among 7 patients overall.
There is no significant variation in the presence of constipation. It was seen among 1 patient.

Table 6: Post op discharge and recurrence during week 1

Discharge	Injection Group	Open Group	Total
No	28	30	58
Yes	4	2	6
Recurrence	I		
No	30	28	58
Yes	2	4	6

ISSN (O): 2687-5365; ISSN (P): 2753-6556

There is no significant variation in the incidence of post op. discharge. It was seen among 6 patients overall during 1st week.
There is no significant variation in the incidence of recurrence. It was seen among 6 patients overall and 4 belonged to the open group.

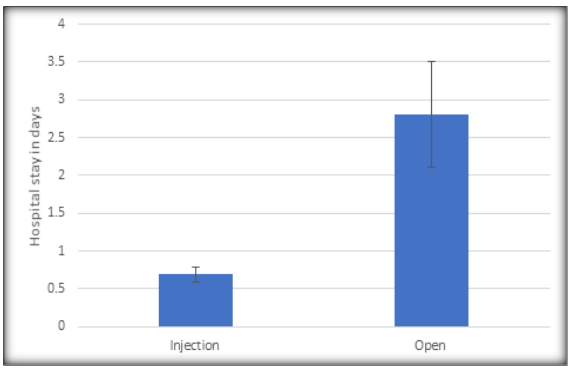

Figure 1: Mean duration of hospital stay in both groups

There is significant variation in the mean duration of hospital stay. It was more in open group of patients. It was less in injection group.

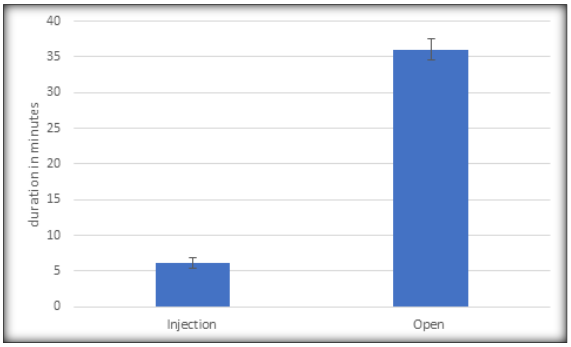

Figure 2: Duration of Procedure in present study

There is significant variation in the duration of procedure. It was more in open group of patients. It was less in injection group of patients.

Table 7: Post-Operative findings in present study

Post-Operative Pain	**1st week(no of patients)**	**2nd week**	**4th week**	**6th week**
Injection sclerotherapy	13	5	3	1
Open haemorrhoidectomy	24	6	2	0
Post-Operative Bleeding				
Injection sclerotherapy	8	2	0	0
Open haemorrhoidectomy	23	15	2	0
Post-Operative Constipation	Week 1	Week 2	Week 4	Week 6
Injection sclerotherapy	5	1	0	0
Open haemorrhoidectomy	2	0	0	0
Post-Operative Discharge	Week 1	Week 2	Week 4	Week 6
Injection sclerotherapy	4	0	0	0
Open haemorrhoidectomy	2	1	0	0

DISCUSSION

The current study was done on 64 patients, who were divided into two study groups. One group(n=32) underwent open heamorridectomy and another group(n=32) underwent injection sclerotherapy. Grade II and III hemorrhoids cases were included. Various sclerosants differ in their their own advantages and drawbacks, each tailored for different treatment scenarios. For eg: ALTA (aluminium potassium sulphate and tannic acid) showed superior efficacy over PAO (Phenol in almond oil) for sclerotherapy, especially in achieving hemostasis.[6] In comparing polidocanol to phenol, polidocanol requires less frequent treatments and yields more patient satisfaction. Studies showed that polidocanol foam is found to be more safe and effective compared to liquid polidocanol. whereas PAO was found to be effective in treating internal hemorrhoids up to grade 3. whereas ALTA has shown efficacy in treating prolapsing internal hemorrhoids from grades 2 to 4.[7] There is no significant variation in mean age in between groups. Mean age was 41.3 years in injection group and 39 years in open group. There is no significant variation in gender in between groups.

Overall 38 patients were males, 26 patients were females in the present study. Ammanagi et al [8] did a prospective type of study on ninety patients diagnosed with Grade 2 Internal Hemorrhoids, Bagalkot, from November 2012 to December 2013. The patients underwent systemic examination and basic investigations. Patients were allocated to three treatment groups: Banding (n=30), and sclerotherapy (n=30) and open surgery Hemorrhoidectomy (n=30). The Results showed that hemorrhoids were most prevalent among individuals aged from 36 to 45 years. Among 90 patients involved in the study, 52 patients were males and 38 patients were females. In the present study also, males were more commonly involved compared to females. Our study results were consistent with the results of Badal and Sharma,[9] who found that out of 87 patients, females were less compared to males. Male preponderance was found in study done by Kumar et al,[10] also.
Gahltot et al,[11] Did a comparative study involving 100 cases with second-degree hemorrhoids treated between 2021 and 2022 at Bikaner. The cases were then divided into 2 groups: sclerotherapy group and hemorrhoidectomy groups. Results showed that average age in H group was 38.56 years, and in SCL group it was 39.08 years. This implies that both

ISSN (O): 2687-5365; ISSN (P): 2753-6556

groups are comparable age-wise. Krishna Mohan et al,[12] compared different management methods regarding post- procedural complications in patients with hemorrhoidal disease. Their study included 120 patients presenting with bleeding per rectum at the outpatient, Gandhi Hospital, Secunderabad. Patients were divided into three groups: banding, sclerotherapy, and open hemorrhoidectomy (40 patients in each group). Patients were followed up for two years (2013 to 2015) to assess complications. Hemorrhoids were most prevalent in 4th decade, with a male predominance, and bleeding as the predominant symptom.

There is no significant variation in the chief complaint in between groups in the present study. Anal pain was seen among 11 patients, bleeding was seen among 35 patients, prolapse was seen among 11 patients and constipation among 5 patients in the present study. There is significant variation in the mean length of hospital stay. It was more in open group of patients. In the study of Ammanagi et al.[8] the most common complaints were bleeding per rectum and rectal mass, which were reported by 33.3% of patients. Postoperative hospital stays were 1 day for sclerotherapy group, and patients who underwent open hemorrhoidectomy surgery stayed for 3 days (28 patients) or five days (2 patients). In conclusion, the study found that RBL was the most reliable and cost effective treatment for grade 2 hemorrhoids, with fewer post-operative complications. In the study of Gahlot et al,[11] The mean length of hospital stay was significantly shorter in sclerotherapy group compared to the surgery group. In the study of Cheng et al-done on 120 patients diagnosed with 2nd degree hemorrhoids, who were assigned to 4 groups: injection, RBL, MAD and hemorrhoidectomy, each comprising 30 patients. Patients were followed up regularly. They eported that hemorrhoidectomy resulted in pain among all, anal stenosis in 2 patients, and postoperative bleeding in 2 patients. Average duration of hospital stay was 11.5 days and an additional 15.5 days off work. In the study of Rajesh Kumar et al,[9] symptoms seen include, soiling of clothes, pain during defecation, bleeding through rectum ,pruritus, and mass through rectum among 50 patients included. Most of the patients had multiple symptoms. In the systematic review of Jin et al,[13] 21 studies reported duration of hospital admission, with ten treatment comparisons including 2907 patients. The mean duration of stay was around 1.6 days.

There is significant variation in the presence of pain. Overall 37 patients had pain during 1st week. It was more commonly seen among open group of patients There is no significant variation in presence of pain during 2nd week. Overall 11 patients had pain during 2nd week. Overall 5 patients had pain during 4th week. 1 patient had pain finally during 6th week. There is significant variation in presence of bleeding during 1st week in of patients. Overall 31 patients had bleeding and 23 belonged to the open group during 1st week and 2nd weeks. Overall 17 patients had bleeding and 15 belonged to the open group during 2nd week.

2 patients had bleeding and 2 belonged to the open group in the present study. There is no significant variation in constipation incidence during 1st week. It was seen among 7 patients overall. There is no significant variation in constipation. It was seen among 1 patient. There is no significant variation in post op. discharge. It was seen among 6 patients overall. There is no significant variation in the incidence of post op. discharge. It was seen among 1 patient overall in this present study. In the study of Gahlot et al.[11] In surgery group, the majority (96%) experienced pain, and 30% of patients showed bleeding, and in the sclerotherapy(SCL) group, the majority (66%) reported bleeding, and 38% had constipation. The cure rate was substantially high in the sclerotherapy patient group when compared to the surgery group.

Authors concluded that the study found that sclerotherapy caused fewer complications, earlier ambulation, less post-operative hospital stays, and was more cost-effective compared to hemorrhoidectomy. Rubber band ligation(RBL) relieved symptoms in 25 among 30 patients, and maximal anal dilatation relieved symptoms in 24 among 30 patients. Injection was found to be least effective, providing relief to 18 among 30 patients, with a cure rate of around 60%. Krishna mohan et al,[12] reported that among the treatment modalities revealed that patients undergoing hemorrhoidectomy experienced more pain, bleeding and anal stenosis. Patients treated with sclerotherapy had more discharge per rectum, while banding showed a higher recurrence rate. Authors concluded that sclerotherapy results in relatively fewer severe complications like discharge per rectum compared to complications like pain, bleeding, and anal stenosis associated with hemorrhoidectomy and banding, respectively.

In the systematic review of Jin et al,[13]- done using PRISMA guidelines to analyze randomized controlled trials published from 1980 to 2020. They identified manuscripts using MEDLINE, and CENTRAL databases. The review focused on Randomized controlled trials comparing procedural interventions for grade II–III haemorrhoids. The study found 79 RCTs encompassing 9232 patients, analyzing 14 different treatments. More number of RCTs (73%) showed high risk of bias, with outcome measurement being a particularly vulnerable domain. Significant heterogeneity was observed in direct treatment comparisons, notably concerning recurrence of symptoms and post-procedural pain. Authors concluded that haemorrhoidectomy showed lower rates of symptom recurrence, they were also linked to higher incidences of pain, urinary retention, and bowel incontinence. The study underscores the importance of discussing the risks and benefits of each modality for appropriate decision making.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Table 8: Some of the complications of sclerotherapy as reported by other studies include

Author	Complication	Occurrence time	Outcome
Lattuneddu[14]	Lung hypersenstivity reactions	7 days after therapy	Recovered
Rashid[15]	Rspiratory distress syndrome	Soon after therapy	Recovered
Suppiah[16]	Hepatitis	6 days after therapy	Recovered
Schulte[17]	Rectal necrosis, septic infections	1 day after therapy	Recovered
Hachiro[18]	Strangulated hemorrhoid	4 h after therapy	Recovered
Yoshikawa[19]	Acute liver cirrhosis	1 day after therapy	Recovered
Yang[20]	Abdominal compartment syndrome	9 days after therapy	Recovered
Ray[21]	Rectovaginal fistula	NA	NA
Current study	Allergic reactions or hepatitis or rectovaginal fistula were not seen	NA	NA

In the current study, both procedures were found to be safe and effective.

There is no significant variation in recurrence. It was seen among 6 patients overall and 4 belonged to the open group in the present study. LDuring follow-up, hemorrhoidectomy emerged as the most effective treatment. Patients in the cryotherapy groups experienced recurrent symptoms which eventually required hemorrhoidectomy.

Authors concluded that while both hemorrhoidectomy and maximal anal dilation initially provided relief, hemorrhoidectomy proved to as an effective method for long term, as patients in other treatment groups often experienced recurrence necessitating further intervention. Analysis of 18 trials comparing different treatment modalities. Findings show that hemorrhoidectomy was effective compared manual dilation of anus with a reduced need for additional therapy. similar complication rates (P but more pain levels were seen with hemorrhoidectomy.

Patients treated with sclerotherapy has recurrence. The authors concluded that, while hemorrhoidectomy shows higher response rates, and is associated with more complications and post-operative pain compared to RBL. Therefore, hemorrhoidectomy should be used only for cases where patients do not respond adequately to RBL. According to Jehan S et and MacRa et al,[22] during 12 months of follow up, 92% of patients had no symptoms after therapy sclerotherapy. Similarly, Rathore also found that 96% of 1st and 2nd degree hemorrhoids displayed satisfactory relief.

Table 9: Outcomes in comparision to other studies

Author	No of patients	Grade of hemorrhoids	Sclerosant used	Outcomes or conclusion
Current study	64	Grade II and III	--	Effective treatment
Kanellos et al[23]	240	Grade 2 and 3	PAO	Recurrence is seen after three years
Miyamoto et al[24]	604	2 and 3	ALTA	Effective modality
Hachiro et al[25]	448 patients were included	3o4	ALTA	Simple and safe treatment complications are few.
Moser[26]	130 patients	Grade I only	Polidocanol	Innovative and effective treatment
Lobascio[27]	66	2 and 3	Polidocanol	Inexpensive treatment
Tomiki[28]	83 patients	2 and 4	ALTA	Less invasive and more effective

CONCLUSION

Injection sclerotherapy and open haemorrhoidectomy both remain important therapeutic options for managing grade II and III haemorrhoids. This study demonstrates that while open haemorrhoidectomy is associated with longer procedure time, hospital stay, and greater postoperative morbidity (notably pain and bleeding), it provides durable results and remains the definitive treatment in recurrent or advanced cases.

In contrast, injection sclerotherapy using sodium tetradecyl sulfate is a safe, simple, and minimally invasive outpatient procedure. It is associated with significantly reduced postoperative minimally invasive outpatient procedure. It is associated with significantly reduced postoperative pain, shorter recovery time, and minimal hospital stay, making it particularly suitable for low- resource settings and patients unfit for surgery. Despite a slightly higher recurrence potential, it is effective for initial management and offers a good quality of life post-treatment.

Given the ease of administration, lower cost, and favorable safety profile, injection sclerotherapy should be considered a first-line option for grade II and selected grade III haemorrhoids. For patients with recurrence or more severe symptoms, haemorrhoidectomy remains the procedure of choice. Larger multicenter trials with longer follow-up are needed to further validate these findings.

Acknowledgments

We thank all the faculty, staff, and patients at GITAM Institute of Medical Sciences and Research for their participation and support.

Conflicts of Interest: None declared

Funding: Self-funded.

REFERENCES

1. Lohsiriwat V. Approach to hemorrhoids. Curr Gastroenterol Rep 2013; 15:332.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

2. Thomson WH. The nature and cause of haemorrhoids. Proc R Soc Med 1975; 68:574-5.
3. Ali SA, Shoeb MF. Study of risk factors and clinical features of hemorrhoids. Int Surg J 2017; 4:1936-9
4. Cohen Z. Symposium on outpatient anorectal procedures. Alternatives to surgical hemorrhoidectomy. Can J Surg 1985; 28:230-1.
5. Johanson JF, Rimm A. Optimal nonsurgical treatment of hemorrhoids: A comparative analysis of infrared coagulation, rubber band ligation, and injection sclerotherapy. Am J Gastroenterol 1992; 87:1600-6.
6. Yano T, Yano K. Comparison of injection sclerotherapy between 5% phenol in almond oil and aluminum potassium sulfate and tannic acid for grade 3 hemorrhoids. Ann coloproctol. 2015;31(3):103–105.
7. Moser KH, Mosch C, Walgenbach M, Bussen DG, Kirsch J, Joos AK, et al. Efficacy and safety of sclerotherapy with polidocanol foam in comparison with fluid sclerosant in the treatment of first-grade haemorrhoidal disease: a randomised, controlled, single-blind, multicentre trial. Int J Colorectal Dis. 2013;28(10):1439–1447.
8. AmmanagiAS, MathewT.A comparative study of sclerotherapy and rubber band ligation versus open hemorrhoidectomy in second degree hemorrhoids.Int Surg J2019;6:1545-8
9. Badal RK, Sharma MK. Assessment of cases of hemorrhoids in adults-a clinical study. J Adv Dent Sci Res 2019; 7:39-43.
10. Rathore RK. Comparative study of management of second and third degree hemorrhoids with injection sclerotherapy using Polidocanol. Int J Surg Sci 2019; 3:145-7.
11. Navratan Gahlot, Ashok Kumar, Diwan Jakhar, Kedar Nath, Monika Pareek. A comparative study of sclerotherapy and hemorrhoidectomy in second-degree hemorrhoids. AJPCR. 2023;16(12):111-4.
12. Mohan NK, Ramesh D, Raufuddin MK. Comparative study of various methods of treatment in relation to post procedural complications of haemorrhoidal disease. J. Evid. Based Med. Healthc. 2016; 3(11), 314-320.
13. Jin JZ, Bhat S, Lee KT, Xia W, Hill AG. Interventional treatments for prolapsing haemorrhoids: network meta-analysis. BJS Open. 2021 Sep 6;5(5):zrab091.
14. Lattuneddu A, Farneti F, Lucci E, Colinelli C. A pulmonary allergic reaction after injection sclerotherapy for hemorrhoids. Int J Colorectal Dis. 2003;18(5):459– 460.
15. Rashid MM, Murtaza B, Gondal ZI, Mehmood A, Shah SS, Abbasi MH, et al. Injection sclerotherapy for haemorrhoids causing adult respiratory distress syndrome. J Coll Phys Surgeons-Pakistan Jcpsp. 2006;16(5):373–375.
16. Suppiah A, Perry EP. Jaundice as a presentation of phenol induced hepatotoxocity following injection sclerotherapy for haemorrhoids. Surg J Royal Coll Surg Edinb Irel. 2005;3(1):43–44.
17. 67. Schulte T, Fändrich F, Kahlke V. Life-threatening rectal necrosis after injection sclerotherapy for haemorrhoids. Int J Colorectal Dis. 2008;23(7):725–726.
18. Hachiro Y, Kunimoto M, Abe T, Muraki S, Kusano M. Strangulation of internal hemorrhoids complicating sclerosing therapy with injection of OC-108 (Zione) Int J Colorectal Dis. 2007;22(7):851–852.
19. Yoshikawa K, Kawashima R, Hirose Y, Shibata K, Akasu T, Hagiwara N, et al. Liver injury after aluminum potassium sulfate and tannic acid treatment of hemorrhoids. World J Gastroenterol. 2017;23(27):5034–5040.
20. Yang P, Wang YJ, Li F, Sun JB. Hemorrhoid sclerotherapy with the complication of abdominal compartment syndrome: report of a case. Chin Med J. 2011;124(12):1919–1920.
21. Ray S, Mandal S, Khamrui S. Rectovaginal fistula: an extremely rare complication after injection sclerotherapy for hemorrhoids. Am
22. surg. 2013;79(4):E143–144.
23. Jehan S, Ali M, Ateeq M, Bhopal FG. Sclerotherapy versus rubber band ligation; Comparative study of efficacy and compliance in the treatment of uncomplicated second degree. Prof Med J 2012; 19:222-7.
24. Kanellos I, Goulimaris I, Vakalis I, Dadoukis I. Long-term evaluation of sclerotherapy for haemorrhoids. Prospect study Int J surg inv. 2000;2(4):295–298.
25. Miyamoto H, Asanoma M, Miyamoto H, Shimada M. ALTA injection sclerosing therapy:non-excisional treatment of internal hemorrhoids. Hepato-gastroenterolgy. 2012;59(113):77–80.
26. Hachiro Y, Kunimoto M, Abe T, Kitada M, Ebisawa Y. Aluminum potassium sulfate and tannic acid (ALTA) injection as the mainstay of treatment for internal hemorrhoids. Surg Today. 2011;41(6):806–809.
27. Moser KH, Mosch C, Walgenbach M, Bussen DG, Kirsch J, Joos AK, et al. Efficacy and safety of sclerotherapy with polidocanol foam in comparison with fluid sclerosant in the treatment of first-grade haemorrhoidal disease: a randomised, controlled, single-blind, multicentre trial. Int J Colorectal Dis. 2013;28(10):1439– 1447.
28. Lobascio P, Laforgia R, Novelli E, Perrone F, Di Salvo M, Pezzolla A, et al. Short-term results of sclerotherapy with 3% polidocanol foam for symptomatic second- and third-degree hemorrhoidal disease. J investig Surg Off J Acad Surg Res. 2021;34(10):1059–1065.
29. Tomiki Y, Ono S, Aoki J, Takahashi R, Ishiyama S, Sugimoto K, et al. Treatment of internal hemorrhoids by endoscopic sclerotherapy with aluminum potassium sulfate and tannic acid. Diagn Ther Endosc. 2015; 2015:517690.

ISSN (O): 2687-5365; ISSN (P): 2753-6556