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ORIGINAL ARTICLE

Efficacy of Combined Local Infiltration Anaesthesia and Controlled Anal Dilatation Followed by Conservative Therapy Versus Conservative Therapy Alone in Acute Primary Anal Fissure - A Preliminary Report

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Abstract

Introduction: Anal fissure is a painful anorectal disorder characterized by sphincter spasm and impaired healing due to elevated internal sphincter tone. Conservative management remains the mainstay, but persistent symptoms often progress to chronicity requiring surgical intervention. **Methods:** A prospective study was conducted over 18 months at Nil Ratan Sircar Medical College, Kolkata, involving 40 patients with acute midline anal fissure. Participants were randomized into two equal groups. The test group received local infiltration anaesthesia with 1% lignocaine at four quadrants followed by two-finger controlled anal dilatation (CAD) to a 40 mm anal opening, in addition to standard conservative therapy. The control group received conservative management alone. Outcomes were evaluated at 1, 2, 3, and 6 weeks using the Visual Analogue Scale (VAS) for pain, bleeding, sphincter tone, and associated symptoms. **Results:** Baseline parameters were comparable between groups. The test group showed significantly earlier pain relief ($p < 0.01$), faster cessation of bleeding ($p \approx 0.02$), and normalization of sphincter tone ($p < 0.001$) compared with controls. Improvement in discharge and pruritus was observed but was not statistically significant. No complications, including incontinence, were reported. **Conclusion:** Local anaesthetic-assisted CAD, when combined with conservative therapy, offers superior short-term symptomatic relief and accelerates healing in acute anal fissure without compromising continence. Despite limitations of small sample size and short follow-up, this simple office-based intervention appears to be a safe and effective adjunct to standard care, potentially reducing chronicity and need for surgery.

Keywords: Anal fissure, Controlled anal dilatation, Local infiltration anaesthesia, Conservative management

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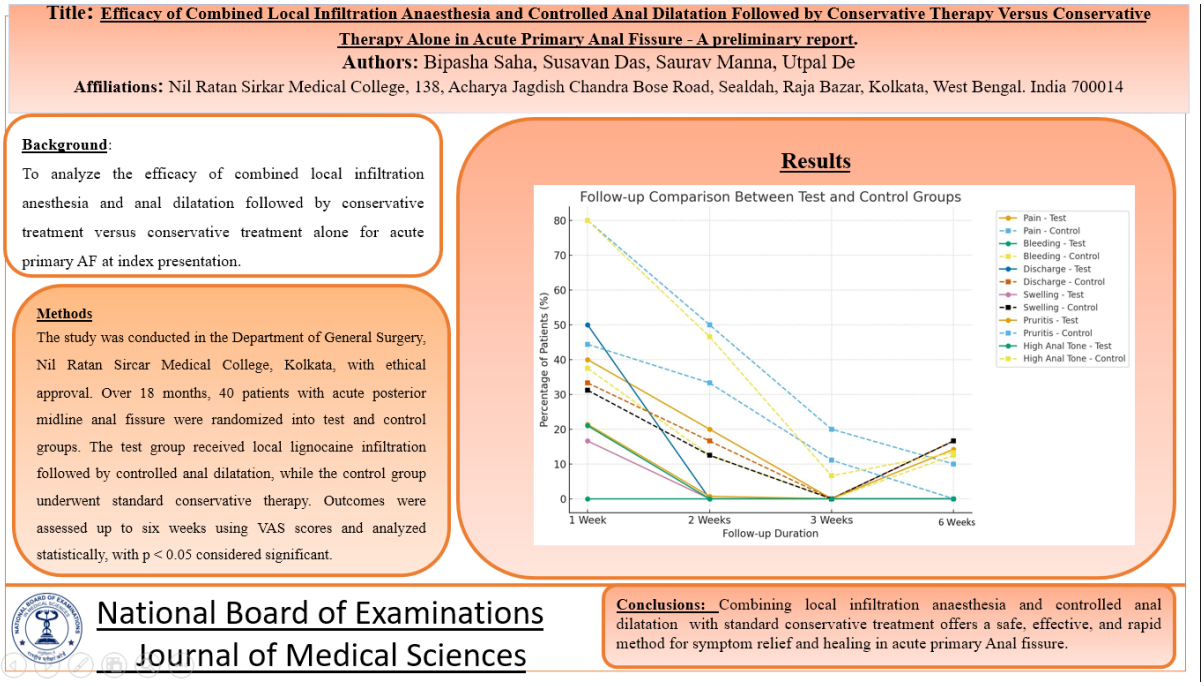
Graphical Abstract



Introduction

Anal fissure (AF) is a longitudinal tear in the anoderm (below the dentate line up to anal verge). Though described as common, the exact incidence is unknown and is comparable to appendectomies with a lifetime risk of 7.8% [1]. It is typically located in posterior midline (90%) and primarily occurs due to excessive straining, constipation, or trauma to the anal canal [1,2]. Females are more commonly affected than males (1.14 vs 1.04 per thousand person-years) [3]. The commonest age of presentation in females is adolescent and young adulthood whereas males are affected in their middle age. Patients typically present with acute pain (throbbing lasting for hours after passage of stool), bright red bleeding (70%), and sphincter spasm, which significantly impact their quality of life [2,4]. Thus, anal fissures pose a unique therapeutic challenge due to increased internal anal sphincter tone and significant patient discomfort.

AF can be acute or superficial or chronic. Chronic AF are those that last for more than six weeks and is associated with fibrous anal polyps, skin tags, induration at the edges, exposed internal sphincter at the floor, infected base and bridged fissure (a post fissure fistula) [1,2,5].

While conservative treatment remains the first-line approach for acute AF, many patients experience persistent symptoms, leading to prolonged suffering and an increased risk of chronicity [6]. This necessitates operative interventions like, fissurectomy, the gold standard internal anal sphincterotomy (LIS), LASER ablation and radiofrequency surgery to enhance healing and symptom relief [3,5,7].

Lord's anal dilatation (LAD), the once conventional treatment practiced for decades fell into disrepute due to higher rate of incontinence (52%) and was abandoned [8]. However, recently standardised anal dilatation or controlled anal dilatation (CAD) has resurfaced with promising

results (healing rate 88%, incontinence 1%) but with limited evidence [8].

Thus, combining local infiltration anaesthesia with CAD may offer a middle ground between conservative and surgical interventions by immediate analgesia, enhancing AF healing, improving patient compliance and overall experience during the initial intervention.

This study aims to analyse the efficacy of combined local infiltration anaesthesia and anal dilatation followed by conservative treatment versus conservative treatment alone for acute primary AF at index presentation.

Methodology

The study was conducted in the Department of General Surgery, Nil Ratan Sircar Medical College and Hospital, Kolkata, after obtaining approval from the Institutional Ethics Committee. It was a longitudinal, descriptive comparative study carried out over 18 months from June 2023 to November 2024, involving both outpatient and inpatient participants. Patients presenting with acute primary posterior midline AF were included. A total of 40 patients were enrolled and divided equally into a test and a control group. The sample size was determined using a standard formula for comparing two proportions, with assumptions based on existing literature showing an expected improvement in outcomes from 36.8% with manual anal dilatation to 60% when combined with local anaesthesia [9]. After accounting for a 10% dropout rate, the total sample size was fixed at 40 participants.

Patients aged 12–80 years with primary acute AF were eligible for inclusion. Those with fissures of secondary etiology, chronic fissures, high-risk conditions such as ischemic heart disease or chronic kidney disease, pregnancy, or unwillingness to undergo examination or follow-up were excluded.

Participants in the control group received conservative management, which included Sitz baths, high-fiber diet, stool softeners, and topical application of 2% lignocaine and nifedipine ointment. The test group underwent a combined approach involving local infiltration anesthesia (LIA) with 5 ml of 1% lignocaine injected at 12, 3, 6, and 9 o'clock positions in the inter-sphincteric plane, followed by a 5-minute interval and controlled two-finger (fore and middle figure) anal stretching in various directions with gradually exerted outward pressure till a 40 mm diameter (vernier caliper) of anal opening was achieved (Figure 1). This was followed by a 5-minute hot compression over the region. Both groups continued the same conservative regimen thereafter for two weeks. The procedure was performed by the same surgeon in all the cases.

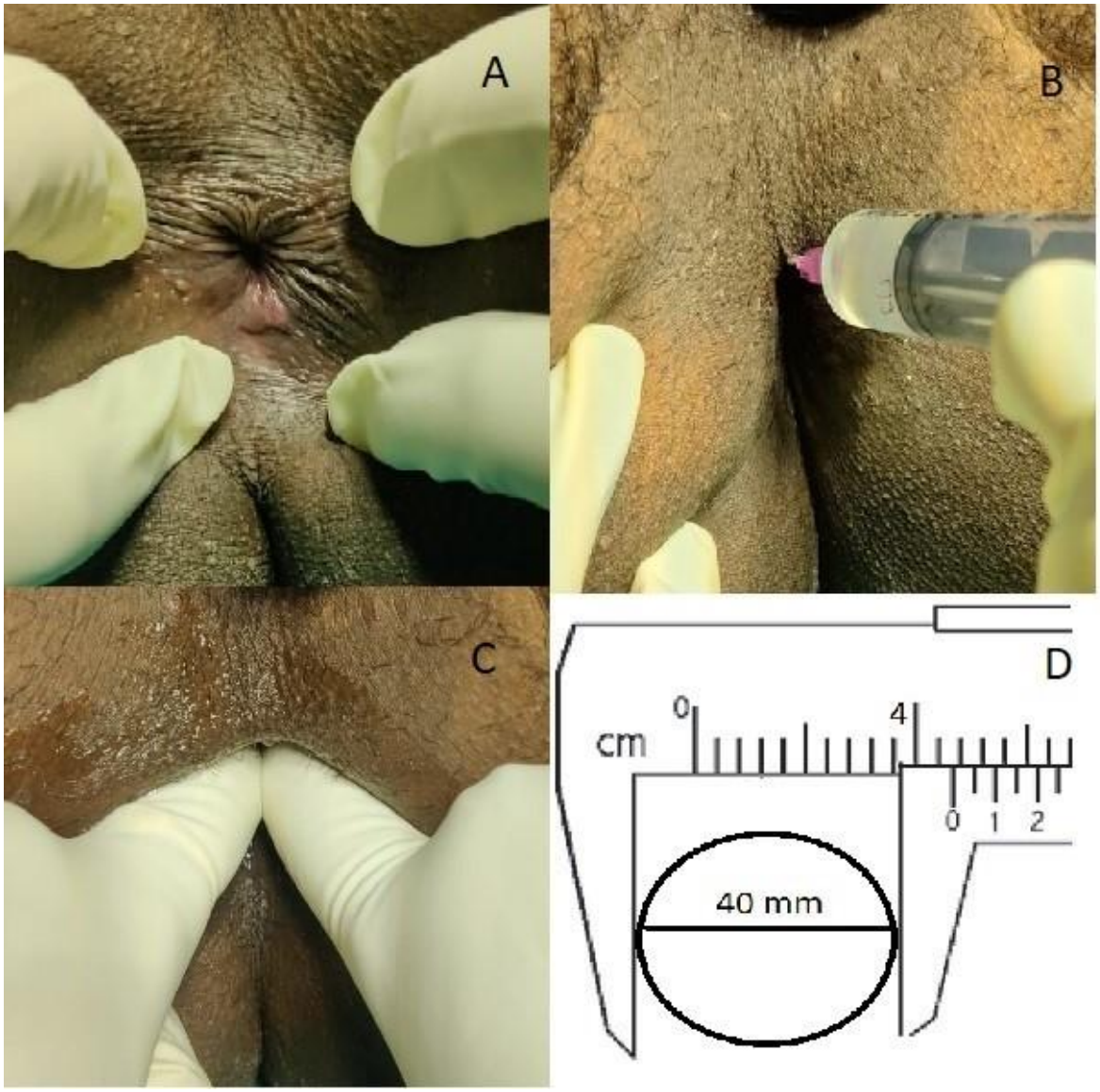


Figure 1. **A**. posterior midline anal fissure, **B**. Local infiltration anaesthesia with 2% lignocaine, **C**. Controlled anal stretching, **D**. Measurement with vernier caliper.

Follow-up was conducted at 1 week, 2 weeks and 3 weeks, with observation extending up to 6 weeks by the same surgeon who performed the procedure. Persistence of symptoms beyond this period or the development of sentinel tags or features of chronic fissure on examination was considered a treatment failure. Data were collected on a structured proforma, including demographic and clinical parameters. Pain intensity was recorded using the Visual Analogue Scale (VAS), along with secondary symptoms such as bleeding, discharge, swelling, pruritus, and anal sphincter tone. Data were tabulated in Microsoft Excel and analyzed using standard statistical software. Descriptive statistics were applied for baseline variables, while categorical data were compared using the Chi-square or Fisher's exact test, with a p-value of less than 0.05 considered statistically significant. Findings were presented using tables and graphical charts for better interpretation.

Results

A total of 40 patients were enrolled, equally divided into Test and Control groups (n=20 each) (Table 1). Baseline demographic, socioeconomic, and clinical parameters were comparable between the groups (p>0.05). Both groups showed a similar distribution of age, gender, religion, comorbidities, and socioeconomic status, with most patients belonging to the 31–50-year age range and middle socioeconomic classes. Dietary habits, family type, addiction profile, and place of residence were also evenly distributed, ensuring group comparability.

Table 1. Demographic and Baseline Characteristics of Study Participants (n = 40)

Variable	**Levels**	**Control group**	**Percent**	**Test group**	Percent	P value
Gender	Male	14	70	12	60	0.51
	Female	6	30	8	40	
Age (In Years)	21-30	5	25	4	20	0.87
	31-40	5	25	5	25	
	41-50	7	35	6	30	
	51-60	2	10	2	10	
	61-70	1	5	3	15	
Religion	Hindu	7	35	9	45	0.52
	Muslim	13	65	11		
Comorbidity	HTN	3	15	2	10	0.74
	HTN /T2DM	1	5	3	15	
	T2DM	3	15	1	5	
	HYPO THY	1	5	X		
	COPD	2	10	1	5	
	NIL	10	50	13	65	
SE Status	KS II	2	10	1	5	0.78
	KS III	9	45	11	55	
	KS IV	9	45	9		
Type of Family	Joint	3	15	1	5	0.29
	Nuclear	17	85	19	95	
Dietary Habit	Non-Veg	17	85	18	90	0.67
Addiction	Alcohol	7	35	9	45	0.81
	Tobacco	6	30	5	25	
	NIL	7	35	6	30	
Place of Residence	Rural	6	30	8		0.41
	Semi Urban	2	10	6	30	
	Urban	12	60	6	30	
Total		**20**		**20**		

Clinically, pain was the universal presenting symptom in all patients with comparable mean VAS scores (8 in Test vs. 7 in Control). Associated symptoms such as bleeding, discharge, and pruritus showed no significant intergroup difference (Table 2).

Table 2. Clinical presentation of the patients in Test (20) and Control group (20)

Variable	Gr.	N	%
Pain	PATIENT T	20/20 VAS score (Avg) – 6-10 (8)	100
	PATIENT C	20/20 VAS score (Avg) – 7-10 (7)	100
Pain Affecting Daily Activities	PATIENT T	5/20	25
	PATIENT C	7/20	35
Duration of Pain	PATIENT T	7 – 14 days (Avg – 8 days)	X
	PATIENT C	5 – 16 days (Avg – 6 days)	X
Bleeding	PATIENT T	5/20	25
	PATIENT C	8/20	40
Discharge	PATIENT T	2/20	10
	PATIENT C	6/20	30
Pruritis(Y/N)	PATIENT T	14/20	70
	PATIENT C	9/20	45

Digital rectal examination findings revealed similar local pathology across groups. High anal sphincter tone was slightly more frequent in the Test group (95% vs. 75%), and the canoe-shaped fissure was the predominant type in both. Muscle fibre exposure, bleeding, and pus discharge from the fissure floor were somewhat more frequent in the Test group, though without statistical significance ($p>0.05$) (Table 3).

Table 3. Finding at digital rectal examination in Test (20) and Control group (20)

Variable	Gr.	N	%
Tone of Anal Sphincter (high)	PATIENT T	19/20	95
	PATIENT C	15/20	75
Shape of Fissure Canoe [C] Button Hole [B]	PATIENT T	C – 16/20 B – 4/20	80 20
	PATIENT C	C – 18/20 B – 2/20	90 10
Floor Muscle Fibre (M) Bleeding (B) Pus Discharge (P)	PATIENT T	M – 1/20 B – 12/20 P – 6/20	5 60 30
	PATIENT C	M – 2/20 B – 10/20 P – 2/20	10 50 10
Edges Indurated (I) Non-Indurated (NI)	PATIENT T	I – 18/ 20 NI – 2/20	90 10
	PATIENT C	I -16/20 NI – 4/20	80 20

Follow-up analysis showed a faster and more complete recovery in the Test group. Pain resolved significantly earlier ($p<0.01$), with all Test patients' pain-free by the third week compared to 20% of Controls. Bleeding cessation was complete in the Test group at all follow-ups, while a proportion of Control patients continued to bleed ($p\approx0.02$). Although discharge, swelling, and pruritus showed better trends in the Test group, these did not reach statistical significance. A highly significant improvement was observed in the normalization of anal sphincter tone in the Test group ($p<0.001$). Overall, both groups were comparable at baseline, but the Test group demonstrated faster and statistically significant symptomatic recovery during follow-up (Table 4).

Table 4. Follow-up comparing symptom resolution over time between the Test (T) and Control (C) groups

Variable	Group	1 Week (%)	2 weeks (%)	3 weeks (%)	6 weeks (%)	p value
Pain	PATIENT T	40	20	0	0	< 0.01 (S)
	PATIENT C	80	50	20	10	
Bleeding	PATIENT T	0	0	0	0	0.02 (S)
	PATIENT C	37.5	12.5	0	12.5	

Discharge	PATIENT T	50	0	0	0	> 0.05 (NS)
	PATIENT C	33.3	16.6	0	16.6	
Swelling	PATIENT T	16.6	0	0	0	0.09 (NS)
	PATIENT C	31.2	12.5	0	16.6	
Pruritis	PATIENT T	21.4	0.7	0	0	> 0.05 (NS)
	PATIENT C	44.4	33.3	11.1	14.2	
High anal Tone	PATIENT T	21	0	0	0	< 0.001 (HS)
	PATIENT C	80	46.6	6.6	13.3	

Discussion

The incidence of progression from acute AF to chronicity necessitating operation (LIS) is reported to be 40%. [4,7,9,10]. The main reason being failure of conservative management. LIS the gold standard operation for chronic anal fissure results in a healing rate of 88–100% [3-5,11]. Though LIS has the highest odds ratio of healing compared to other forms of treatment it is associated with significant rate of incontinence (0–44.4%) and wound related complications [10–12]. The reoperation rate following LIS is about 3% [13].

Anal dilatation is an office procedure, easy to perform, and does not require any equipment. It was the procedure of choice in 1960's resulting in healing rate of 95% with early symptom relief. But long-term results showed significant incontinence rates of about 52% [2,7,8,14]. Thus the procedure was abandoned.

Comparable literature, supports CAD as an effective adjunct in acute fissure management, particularly when conservative measures fail with healing rates of 88% and incontinence rate of 1% [13].

The present study was based on the above findings. It evaluated the efficacy of combining local infiltration anaesthesia (LIA) and controlled anal dilatation followed by conservative therapy versus conservative treatment alone in acute primary AF. Both groups were comparable at baseline in terms of demographic and clinical parameters, ensuring unbiased outcome comparison. The results demonstrated a significant advantage of the combined approach in terms of early pain relief, faster cessation of bleeding, and normalization of sphincter tone, indicating enhanced healing dynamics (Figure 2). These findings support the hypothesis that transient reduction of internal sphincter hypertonicity through controlled dilatation improves anodermal perfusion and fissure healing, within three weeks, emphasizing its utility as an intermediate step before surgical intervention.

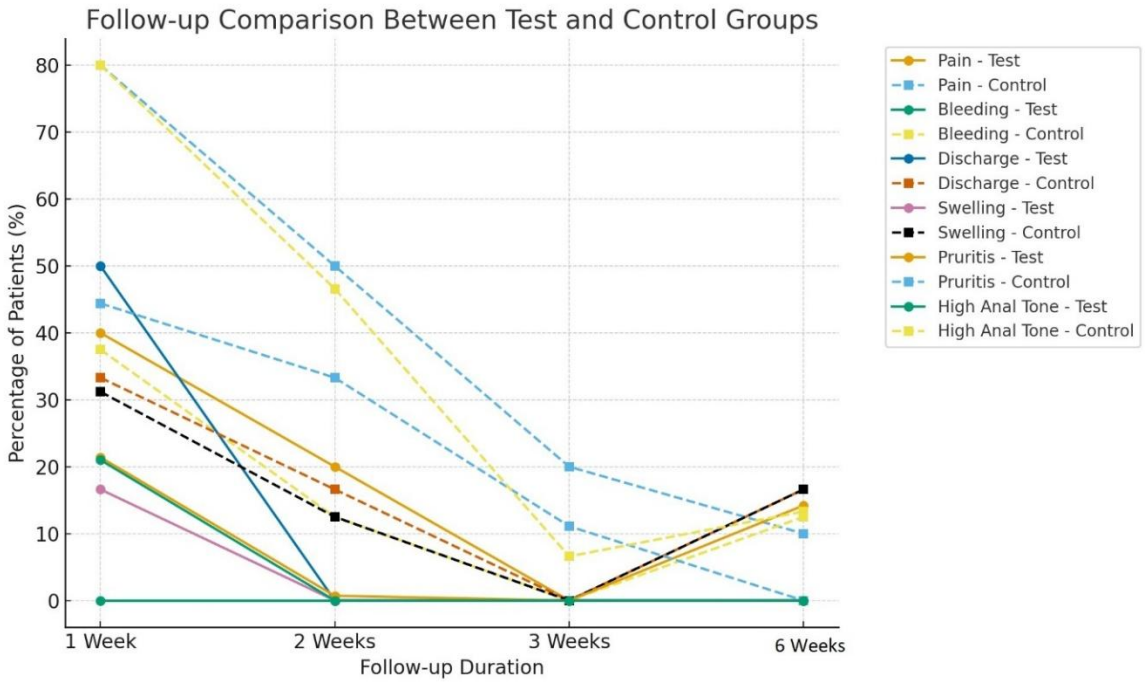


Figure 2. Line diagram comparing symptom resolution over time between the Test (T) and Control (C) groups. The plot clearly shows a faster decline in symptom prevalence across all variables in the Test group, for pain and high anal tone, indicating superior recovery outcomes.

However, absence of significant differences in secondary symptoms such as discharge and pruritus indicates that the primary benefit of this combined approach lies in pain control, restoration of sphincter physiology and mucosal healing effects. (Table 4). Importantly, no major adverse effects such as incontinence were reported, highlighting the safety of the controlled technique employed.

The study was limited by its small sample size and single-centre design, which may restrict generalizability. The short follow-up period of three months precludes long-term recurrence assessment. Additionally, subjective evaluation of pain and sphincter tone may introduce observer bias. Larger, multicentric randomized controlled trials with longer follow-up are recommended to validate these findings and assess durability and recurrence rates.

Conclusion

Combining local infiltration anaesthesia and CAD with standard conservative treatment offers a safe, effective, and rapid method for symptom relief and healing in acute primary AF. The approach bridges the gap between conservative and surgical management, providing a physiologically sound, minimally invasive option for early intervention. Early pain relief, faster bleeding cessation, and improved sphincter relaxation were the key outcomes, making this combined technique a valuable adjunct to conservative therapy.

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I acknowledge the use of ChatGPT (https://chat.openai.com/) to refine the academic language and accuracy of my own work. I submitted my entire essay and

entered the following prompts on 19 October 2025. Improve the academic tone and accuracy of language, including grammatical structures, punctuation and vocabulary

Declarations Conflict of interests

The authors have no competing interests to declare that are relevant to the content of this article.

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