

Chemical Sphincterotomy – First Line of Treatment for Chronic Anal Fissure

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Anal fissure is a common disorder which may cause symptoms at any age. Internal anal sphincterotomy is the gold standard surgical treatment which lowers the resting anal pressure and effectively heals the majority of fissures. However the post operative period may be marked by surgical risks, complications and late incidence of incontinence that is some times permanent. These complications has led to a search for alternative therapies for the treatment of chronic anal fissure. Chemical sphincterotomy has been tried using a variety of novel agents including topical glyceryl trinitrate (GTN), calcium channel blockers such as nifedipine or diltiazem and botulinum toxin. Some of these agents were found to be effective in healing chronic anal fissure with negligible side effects and are now considered as first line treatment for chronic anal fissure.

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Introduction

Anal fissure is one of the most common proctologic problems. Fissures are seen in all age groups although the majority of the patients are relatively young to middle aged adults¹.

A fissure is an oval ulcer like lesion in the anoderm, distal to the dentate line². Acute anal fissures are usually superficial splits and causes stabbing and burning pain during and after defecation and usually heals spontaneously³.

Chronic anal fissures are associated with hypertonia of the anal canal⁴ and a reduction in mucosal blood flow with a poor healing tendency⁵.

The gold standard surgical treatment for chronic anal fissure is internal anal sphincterotomy which lower the anal resting pressure and effectively heals the majority of the fissure^{3,4,6}.

But the surgical treatment is found to produce permanent impairment of anal continence in 1/3 of the patients⁷. This has led to search for alternative therapies for the treatment of chronic anal fissure.

Pathogenesis of chronic anal fissure

Despite different attempt to elucidate the pathogenesis of anal fissure, the cause of this painful lesion is still unknown.

It has been proposed that increased sphincteric pressure may cause ischaemia of the anal lining⁸.

An angiographic post-mortem study which revealed that small branches of both inferior rectal arteries passing through internal anal sphincter (IAS) have no or minimal contact at the posterior commissure in 95% cases, suggesting that posterior commissure is less well perfused than other parts⁹. A prospective study in patients with chronic anal fissure to evaluate the relation between anal pressure and anodermal blood flow¹⁰.

Maximum anal resting pressure and anodermal blood flow expressed as flux in control and patients with fissure before and after lateral internal sphincterotomy (LIS) value are mean (SD).

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The study revealed maximum resting anal pressure in patients with chronic anal fissure was significantly higher than that in controls. After successful lateral sphincterotomy, both maximum anal resting pressure and anodermal blood flow regained to normal values.

Failure to heal was mainly due to impaired perfusion of the anoderm resulting in ischaemic ulceration which explains the characteristic feature of the painful condition¹⁰.

Pharmacological agents used in chemical sphincterotomy

To avoid the risk of anal incontinence associated with surgical treatment, different pharmacological agents are used for healing of chronic anal fissure with promising results.

Isosorbide dinitrate/glycerin trinitrate (GTN)

This is metabolized by body cells with production of nitric oxide (NO). Nitric oxide causes reduction in anal sphincteric pressure by relaxing sphincteric muscle, thereby increasing anodermal blood flow and healing of fissure^{11,12}. However, the promising results of topical GTN were impaired due to its side effects, which include headache (50%), tachyphylaxis, anal burning and risk of recurrence^{13,14}.

Calcium channel blockers

Nifedipine: Dihydropyridine is used mainly in cardio-vascular diseases. It causes smooth muscle relaxation and vasodilatation. Topical application has been shown to lower anal resting pressure and heal acute and chronic anal fissures¹⁵.

Nifedipine action

Nifedipine acts by inhibiting the flow of extracellular calcium Ca into sarcoplasm of internal anal sphincter and decreasing the smooth muscle cell tone.

A multicentric study from Italy in 1997 with topical application of nifedipine with lidocaine ointment revealed that healing of chronic anal fissure occurs in 94% of cases without side effects and long term follow up showed low risk of

recurrence. No significant changes in pulse rate and blood pressure were noted during the study.²

Diltiazem

Diltiazem is a calcium channel blocker and used in cardio vascular disease. Both oral and topical application of diltiazem significantly decreases resting anal pressure (RAP) thereby causing healing of fissure. It is also effective in GTN resistant anal fissure and long term follow up shows no recurrence¹⁶.

In addition, Botulinum toxin injected into the anal sphincter also causes healing of fissure but it is invasive, more expensive and painful¹⁷.

Conclusion

Pharmacological agents causing reversible chemical sphincterotomy heal majority of chronic anal fissure and avoid the risk of anal incontinence associated with surgical treatment. Short term follow up has shown no recurrence but extended follow up is required to determine the long term efficacy of these agents. These drugs are widely used all over the world as first line of treatment for chronic anal fissure.

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