TREATMENT OF CHRONIC ANAL FISSURE

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Abstract:
Chronic anal fissure is a non healing ulcer in the anoderm appearing as a painful tear below the dentate line. There are debates about the efficacy of different treatment options for chronic anal fissure. This review aims to evaluate existing and newer treatment modalities. Aspects of chronic anal fissure aetiology and pathogenesis are also reviewed. Glyceryl trinitrate (GTN) ointment, Diltiazem ointment can be used as first line and Botulinum toxin (BTX) injection as second line pharmacological treatment. The effects of these chemicals are not permanent with higher fissure recurrence rates. Lateral internal sphincterotomy is the operative treatment of choice for fissures with high anal tone. Flap anoplasty should be done for fissures with normal anal tone especially in female patients. Both surgical procedures can be used as primary treatment option. The newer treatment options like gonyautoxin, controlled balloon anal dilatation, closed anal sphincterolysis and fissurotomy need more research. Perineal support device can be used as an adjunct to other treatment modalities.

Key words: Chronic anal fissure, Pharmacological treatment, Lateral internal sphincterotomy

Introduction:
A chronic anal fissure is a non healing linear tear in the distal anal mucosa below the dentate line¹. Anal fissure is considered chronic if it persists beyond 4-6 weeks and fails to heal spontaneously¹,². During rectal examination chronic anal fissure can be identified by its indurated edges, visible internal anal sphincter muscle fibres at the floor, sentinel skin tag at the distal end of the fissure and fibroepithelial polyp at the apex¹,². The positions are posterior midline (6 o’clock position, 85%), anterior midline (more common in female, 10%) and lateral (5%)¹,². Primary chronic anal fissures are usually provoked by hard stool and associated with straining during constipation and chronic diarrhea²,³. Secondary chronic anal fissures may be multiple and seen in tuberculosis, inflammatory bowel disease, leukaemia, agranulocytosis and infections (HIV, Syphilis)¹,². Though it can occur in all age groups, chronic anal fissure is more common in young and otherwise healthy adults¹.

Pathogenesis:
The understanding of pathogenesis of chronic anal fissure has evolved over time. Previously it was thought that fissures originate from chronic phlebitis in anal crypts or from cryptitis². Now a days it has been agreed that resting internal anal sphincter tone plays a crucial role⁴,⁵,⁶. Elevated resting internal anal sphincter pressure reduces the anodermal blood flow demonstrated by Doppler laser flowmetry combined

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with anorectal manometry. Initially hard stool or repeated straining may cause anal mucosal tear with anal pain causing anal sphincter spasm thus reducing anodermal blood flow. The resulting ischemia causes further anal pain, persistence of sphincter spasm, reduced blood flow and continuing ischemia of the anoderm thus forming a vicious cycle. This continuing ischemia causes healing failure and persistence of chronic anal fissure. The more common posterior location of chronic anal fissure can be due to the anatomical topography of inferior rectal artery. The terminal branches of this artery supplying the anoderm passes through the internal anal sphincter thus subjected to compression by high sphincter tone. The scarcity of small arteriolar anastomoses between end branches of right and left inferior rectal artery on the dorsal aspect of anoderm were also observed. Other factors may also play roles in the pathogenesis. The paucity of supportive connective tissue between coccyx and anorectal ring as well as the angle of anorectum leads to preferential overstretching of posterior perineum while passage of stool. This may cause repeated trauma to anal sphincter causing pain and sphincter hypertonia. Anti endothelial cell antibody, detected in patients with anal fissure might also be involved by endothelial activation and vasospasm leading to anodermal ischemia. The end stage of a chronic anal fissure is a fibrotic, atonic lesion. Recurrent inflammation at the fissure site can lead to local abscess and fistula formation.

Overview of treatment options

The aim of all modalities of treatment is healing of the fissure. Most of the treatment approaches are directed at reduction of internal anal sphincter tone. Treatment options include non surgical and surgical means. Non surgical treatment involves pharmacological agents including nitrates (isosorbide dinitrate or glyceryl trinitrate) ointments, calcium channel blockers (Diltiazem ointment, nifedipine gel), botulinum toxin injection, α-adrenoceptor antagonists, α-adrenoceptor agonists and muscarinic agents. Newer pharmacological agent such as gonyautoxin, a paralytic phytotoxin derived from shellfish is also under clinical trial. Among the surgical treatment options lateral internal sphincterotomy is the gold standard. Modification of sphincterotomy by blunt division of internal sphincter fibres called sphincterolysis are also tested. Subcutaneous fissurotomy is also in practice. Though finger anal dilatation is considered obsolete, controlled balloon anal dilatation is under evaluation. Flap anoplasty by V-Y advancement flap and rotation flap are also in clinical practice. In addition posterior perineal supportive device, incorporated into a toilet seat, aimed at reducing perineal overstretching during defecation to improve fissure healing is being studied.
Discussion
In evaluating the outcome of different treatment modalities, fissure healing rate, recurrence rate and anal incontinence were taken into consideration. Studies show results of individual treatment option as well as comparisons between different treatment modalities. The data available are heterogenous. This may be due to inclusion of acute fissures in the study, previous treatment, different end points for assessment, addition of new treatment in the event of failure of primary treatment and incomplete follow up. Glyceryl trinitrate (GTN), Diltiazem ointment and Botulinum toxin (BTX) injection are the pharmacological agents most widely used. Glyceryl trinitrate studies show healing rate of 68%, 46%, 49%, 40.4% and 60% using 0.2% GTN ointment. Studies with Diltiazem shows a healing rate of 49%, 67% and 75% using 2% Diltiazem cream. Botulinum toxin injection studies show a healing rate of 27%, 43%, 73% and 96% using 20-30U of BTX injection. The healing efficacy of GTN and Diltiazem appears to be similar though one study reported healing of GTN resistant anal fissures by Diltiazem cream. Less occurrence of headache as a complication was also reported by using Diltiazem cream comparing GTN ointment. Both GTN and Diltiazem have a common advantage of being topical in nature hence can be considered as first line pharmacological treatment. Botulinum toxin injection appears to offer better symptomatic improvement than GTN and Diltiazem, although the healing rate appears to be similar. The healing by BTX is related to dose and number of injection sites. BTX injection has the disadvantage of being an invasive procedure requiring injection into the internal anal sphincter and around the anus with potential side effects like bleeding, haematoma and abscess formation. Also BTX causes temporary anal incontinence rare with GTN or Diltiazem. Though botulinum toxin can be used as first line pharmacological treatment but considering potential serious side effects it has been recommended as second line treatment in the event of GTN or Diltiazem treatment failure. A common disadvantage of all pharmacological agents is the nonpermanent effect on sphincter relaxation resulting in fissure recurrences between 10%-20% on long term follow up. To overcome this, combination of pharmacological agents in slow releasing form have also been suggested. The lateral internal sphincterotomy is the gold standard of surgical treatment. The main concern of sphincterotomy is anal incontinence. The long term (more than 2 months) anal incontinence rate found in this review was in the range of 3.3% - 7%. The conservative lateral sphincterotomy up to fissure apex had significantly less anal incontinence compared to traditional lateral sphincterotomy up to dentate line. The sphincterotomy is associated with better healing rate, less recurrences and better patient compliance than the pharmacological agents. Sphincterolysis by closed anal sphincter manipulation technique appears to offer an alternative to lateral internal sphincterotomy avoiding skin incision and lower anal incontinence. However the sphincterolysis is an uncontrolled procedure and further study is needed to evaluate the long term effects on fissure recurrence and anal incontinence. The flap anoplasty techniques are proposed for chronic anal fissures those fail to heal with pharmacological treatment and also for fissures with normal sphincter tone especially female patients, where persistent anal incontinence following lateral internal sphincterotomy is a risk. Flap anoplasty shows to have a healing rate of approximately 94%. In one study flap anoplasty was suggested to be an alternative to lateral internal sphincterotomy. However the flap failure rate was not clearly mentioned in the study and more clinical research are needed in this field. The subcutaneous fissurotomy is a new technique with a reported healing rate of nearly 98%. But due lack of studies the long term outcome remains to be mentioned. Simple finger anal dilatation has no role in modern day treatment of chronic anal fissure due to unacceptably high rate of anal incontinence. Newer technique of calibrated pneumatic balloon anal dilatation showed similar healing rate as compared to internal sphincterotomy with a significantly reduced post operative anal incontinence. Further investigations will assess its long term outcome. The concept of posterior perineal support is to provide counter pressure to the posterior aspect of pelvic floor balancing the pressure exerted by the faeces, thus reducing trauma to the anal canal wall by hard stool. In one study a toilet seat device to provide posterior perineal support reported significant symptomatic improvement. This device may be used as an adjunct to other treatment options.

Conclusion
There are a number of treatment options for chronic anal fissure and all of them have their merits and
demerits. Glyceryl trinitrate ointment, Diltiazem cream and lateral internal sphincterotomy can be used as first line of treatment. Those fissures with normal or low anal muscle tone can be offered flap anoplasty as primary treatment. The Botulinum toxin injection should be used as second line pharmacological treatment. Newer treatment options need further clinical research.

References
1. Poh A, Tan K-Y, Francis S-C. Innovations in chronic anal fissure treatment: A systematic review. World J Gastrointest Surg. 2010; 27: 231-41
2. Van OM. Physiopathology of the anal fissure. Acta Chir Belg. 2006; 106: 517-8
3. Villalba H, Villalba S, Abbas MA. Anal fissure: A common cause of anal pain. The Permanente Journal. 2007; 11: 62-5
4. Keck JO, Staniunas RJ, Coller JA. Computer generated profiles of the anal canal in patients with anal fissure. Dis Colon Rectum 1995; 38: 72-9
5. Farouk R, Duthie GS, MacGregor AB, Bartolo D. Sustained internal sphincter hypertonia in patients with chronic anal fissure. Dis Colon Rectum 1994; 37: 424-9
6. Horvath KD, Whelan RL, Golub RW, Ahsan HM, Cirroco WC. Effect of catheter diameter on resting pressures in anal fissure patients. Dis Colon Rectum 1995; 38: 728
7. Schouten WR, Briel JW, Auwerda JJ. Relationship between anal pressure and anodermal blood flow: The vascular pathogenesis of anal fissures. Dis Colon Rectum 1994; 37: 664-9
8. Klosterhalfen B, Vogel P, Rixen H, Mittermayer C. Topography of inferior rectal artery: A possible cause of chronic, primary anal fissure. Dis Colon Rectum 1989; 32: 42-52
9. Maria G, Brisinda D, Ruggieri MP, Civello IM, Brisinda G. Identification of anti-endothelial cell antibodies in patient with chronic anal fissure. Surgery. 1999; 126: 535-40
10. Garrido R, Lagos N, Lattes K, Abedrapo M, Bocic G, Cuneo A et al. Gonyautoxin: new treatment for healing acute and chronic anal fissures. Dis Colon Rectum 2005; 48: 335-40
11. Gupta PJ. Closed anal sphincter manipulation technique for chronic anal fissure. Rev Gastroenterol Mex 2008; 73: 29-32
12. Pelta AE, Davis KG, Armstrong DN. Subcutaneous fissurotomy: a novel procedure for chronic fissure-in-ano. a review of 109 cases. Dis Colon Rectum 2007; 50: 1662-7
13. Renzi A, Izzo D, Di Sarno G, Talento P, Torreli F, Izzo G et al. Clinical, manometric, and ultrasonographic results of pneumatic balloon dilatation vs. lateral internal sphincterotomy for chronic anal fissure: a prospective, randomized, controlled trial. Dis Colon Rectum. 2008; 51: 121-27
14. Leong A, Seow-Choen F. Lateral sphincterotomy compared with anal advancement flap for chronic anal fissure. Dis Colon rectum 1995; 51: 122-4
15. Tan KY, Seow-Choen F, Hai CH, Thye GK. Posterior perineal support as treatment for anal fissures-preliminary results with a new toilet seat device. Tech Coloproctol 2009; 13: 11-5
16. Lund JN, Scholefield JH. A randomised, prospective, double blind, placebo-controlled trial of glyceryl trinitrate ointment in treatment of anal fissure. Lancet 1997; 349: 11-4
17. Kennedy ML, Sowter S, Nguyen H, Lubowski DZ. Glyceryl trinitrate ointment for the treatment of chronic anal fissure: results of placebo-controlled trial and long-term follow-up. Dis Colon Rectum 1999; 42: 1000-6
18. Altmare DF, Rinaldi M, Milito G, Arcana F, Spinelli F, Nardelli N et al. Glyceryl trinitrate for chronic anal fissure- healing or headache? Results of a multicenter, randomized, placebo-controlled, double-blind trial. Dis Colon Rectum 2000; 43: 174-9
19. Scholefield JH, Bock JU, Marla B, Richter HJ, Athanasiadis S, Herold A et al. A dose finding study with 0.1%, 0.2%, and 0.4% glyceryl trinitrate ointment in patients with chronic anal fissures. Gut 2003; 52: 264-9
20. Brisinda G, Maria G, Bentivoglio AR, Cassetta E, Gui D, Albanese A. A comparison of injections of botulinum toxin and topical nitroglycerin ointment for the treatment of chronic anal fissure. N Engl J Med 1999; 341: 65-9
21. Jonas M, Speake W, Scholefield JH. Diltiazem heals glyceryl trinitrate-resistant chronic anal fissures: a prospective study. Dis Colon Rectum 2002; 45: 1091-5

22. Carapeti EA, Kamm MA, Phillips RK. Topical diltiazem and bethanechol decrease anal sphincter pressure and heal anal fissures without side effects. Dis Colon Rectum. 2000; 43: 1359-62

23. Knight JS, Birks M, Farouk R. Topical diltiazem ointment in the treatment of chronic anal fissure. Br J Surg. 2001; 88: 553-556

24. Jones OM, Ramalingam T, Merrie A, Cunningham C, George BD, Mortensen NJ et al. Randomized clinical trial of botulinum toxin plus glyceryl trinitrate vs. botulinum toxin alone for medically resistant chronic anal fissure: overall poor healing rates. Dis Colon Rectum 2006; 49: 1574-80

25. Lindsey I, Jones OM, Cunningham C, George BD, Mortensen NJ. Botulinum toxin as second-line therapy for chronic anal fissure failing 0.2 percent glyceryl trinitrate. Dis Colon Rectum 2003; 46: 361-6

26. Mentes BB, Irkorucu O, Akin M, Leventoglu S, Tatlicioglu E. Comparison of botulinum toxin injection and lateral internal sphincterotomy for the treatment of chronic anal fissure. Dis Colon Rectum 2003; 46: 232-7

27. Kocher HM, Steward M, Leather AJ, Cullen PT. Randomized clinical trial assessing the side-effects of glyceryl trinitrate and diltiazem hydrochloride in the treatment of chronic anal fissure. Br J Sur. 2002; 89: 413-7

28. Emami MH, Sayadayahossein S. Chronic anal fissure: new approaches to chemical sphincterotomy. JRMC 2008; 13: 149-55

29. Minguel M, Francisco M, Alejandro E, Eduordo GG, Francisco M, Salvador L et al. Therapeutic effects of different doses of botulinum toxin in chronic anal fissure. Dis Colon rectum 1999; 42: 989-92

30. Garcea G, Sutton C, Mansoori S, Lloyd T, Thomas M. Results following conservative lateral sphincterotomy for the treatment of chronic anal fissures. Colorectal Dis 2003; 5: 311-4

31. Tocchi A, Mazzoni G, Miccini M, Cassini D, Bettelli E, Brozzetti S. Total lateral sphincterotomy for anal fissure. Int J Colorectal Dis 2004; 19:245-9

32. Liratzopoulos N, Efremidou EI, Papageorgiou MS, Kouklakis G, Moschos J, Manolas KJ et al. Lateral subcutaneous internal sphincterotomy in the treatment of chronic anal fissure: our experience. J Gastrointestin Liver Dis 2006; 15: 143-7

33. Wiley M, Day P, Rieger N, Stephens J, Moore J. Open vs. closed lateral internal sphincterotomy for idiopathic fissure-in-ano: a prospective, randomized, controlled trial. Dis Colon Rectum 2004; 47: 847-52

34. Jensen SL, Lund F, Nielsen OV, Tange G. Lateral subcutaneous sphincterotomy versus anal dilatation in the treatment of fissure in ano in outpatients: a prospective randomized study. Br Med J 1984; 289: 528-30

35. Richard CS, Gregoire R, Plewes EA, Silverman R, Burul C, Buie D et al. Internal sphincterotomy is superior to topical nitroglycerin in the treatment of chronic anal fissure: results of a randomized, controlled trial by the Canadian Colorectal Surgical Trials Group. Dis Colon Rectum 2000; 43: 1048-57

36. Evans J, Luck A, Hewett P. Glyceryl trinitrate vs. lateral sphincterotomy for chronic anal fissure: prospective, randomized trial. Dis Colon Rectum 2001; 44: 93-7

37. Brown CJ, Dubreuil D, Santoro L, Liu M, O’Connor BI, McLeod RS. Lateral internal sphincterotomy is superior to topical nitroglycerin for healing chronic anal fissure and does not compromise long-term fecal continence: six-year follow-up of a multicenter, randomized, controlled trial. Dis Colon Rectum 2007; 50: 442-8

38. Elsebae MM. A study of fecal incontinence in patients with chronic anal fissure: prospective, randomized, controlled trial of the extent of internal anal sphincter division during lateral sphincterotomy. World J Surg 2007; 31: 2052-7

39. Singh M, Sharma A, Gardiner A, Duthie GS. Early results of a rotational flap to treat chronic anal fissures. Int J Colorectal Dis 2005; 20: 339-42

40. Giordano P, Gravante G, Grondona P, Ruggiero B, Porrett T, Lunniss PJ. Simple cutaneous advancement flap anoplasty for resistant chronic anal fissure: a prospective study. World J Surg 2009; 33: 1058-63