

Management of Chronic Anal Fissure by Botulinum Toxin Injection: An Article Review

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Abstract

Chronic anal fissure (CAF) is a painful anal condition with an underlying pathophysiology of increased resting internal sphincter tone causing local ischaemia from prolonged compression of anodermal arteries. Botulinum Toxin type-A (BTX-A) is a minimally invasive management of CAF which causes reversible 'chemical sphincterotomy' of internal anal sphincter and reduces the anal tone. This article review analyses 6 studies which have evaluated BTX-A injection in CAF management through various aspects including its efficacy (short-term and long-term), pain relief, safety, role of patient factors, improvement in quality of life, and dose-dependent efficiency. A former meta-analytic study (6) concludes that the efficiency and postoperative incontinence rate is not dose-dependent. Moreover, the healing rates remain similar regardless of the site and number of injections per session. The results of studies are comparable with a success rate of 64.8% to 86.85% and the main side-effect of transient faecal incontinence observed in 8.6% to 13.2%. Although BTX-A injection is a safe and effective minimally invasive treatment in CAF with failed conservative management, there is a significant long-term treatment failure.

Keywords: Chronic Anal Fissure; BTX-A; Pathophysiology

Introduction

Chronic anal fissure (CAF) is a painful condition caused by anodermal tear persisting for >6 weeks. Underlying pathophysiology is increased resting internal sphincter tone causing local ischaemia from prolonged compression of anodermal arteries. Topical pharmacological agents have fundamental drawbacks of short-term effectiveness and potential side-effects. Lateral Internal Sphincterotomy (LIS) is the 'gold standard' treatment for CAF, but has potential risk of postoperative gas/stool incontinence. Botulinum Toxin type-A (BTX-A) is a minimally invasive management of CAF when conservative medical treatment fails. BTX-A blocks acetylcholine release causing short-term paralysis of internal anal sphincter muscle thereby reducing anal tone. This reversible 'chemical sphincterotomy' breaks the cycle of pain-spasm-pain. It is clinically efficacious for about 2-3

months, allowing enough time for fissure healing. BTX-A injection is performed as an outpatient procedure without sedation or local anaesthesia. This article review analyses 6 studies related to management of CAF with BTX-A injections.

Critical analysis

A study on 30 CAF patients [1] by injecting 40 units BTX into internal sphincter showed improved post-defecatory pain in 83.3%, while complete healing in 66.6% at 6 months. Temporary flatus incontinence noted in 10%. The study concluded BTX injection as an effective, non-surgical, easily performed, outpatient technique recommended as first-step in CAF treatment because of the resulting (66.6 to 83.3%) chance of cure.

A prospective cohort study [2] wherein 81 CAF patients injected with 40U BTX-A diluted in 1ml of isotonic saline solution, into

internal sphincter at 3 spots. After 4 weeks follow-up, 28.3% were non-responders, and overall 23.5% resorted to surgery. Pre-treatment and 4 weeks post-treatment pain was assessed using a numeric rating scale (NRS) score (rest and post-defecation). Side-effects (8.6%) included transient flatus incontinence. This study concludes that BTX is effective on pain relief in CAF. However, treatment failure in long-term is significant in spite of uncommon and transient side-effects.

A retrospective study [3] demonstrated the long-term efficacy and safety of BTX in CAF. 126 patients were injected with 25U BTX at intersphincteric groove. At 3 months, 46.6% showed complete response, 23.9% showed partial response, while 29.5% remained refractory. Relapse noted was 1.2% at 6 months, 11.4% at 1 year, 2.3% at 3 years and nil at 5 years. Overall success rate was 64.8% at 5 years follow-up.

A prospective case series of 106 patients [4] evaluated therapeutic properties of BTX for CAF and patient factors role. 30U BTX was injected at 3 sites into internal sphincter. At 8 weeks, healing rate was 84.9%. Mean healing time was 4.68 weeks (3-7 weeks). Mean time of symptom relief was 3.44+1.15 weeks for post-defecatory pain and 2.54+0.96 weeks for bleeding. Mild incontinence noted in 13.2% which resolved spontaneously in 2-8 weeks. Patients with one fissure demonstrated higher healing rate along with shorter healing time compared to patients with

two fissures. Healing rates were higher in females and those with shorter symptom duration.

An observational prospective cohort study of 24 CAF patients [5] compared their quality of life (QOL) before and after BTX treatment. About 60U (40-100U) BTX was injected at intersphincteric groove. Treatment success rate was 86.85%. By utilizing Short-Form(SF-36) Quality of Life Assessment Form, this study demonstrated the improvement in QOL with positive impact on mental, emotional and physical aspects of patient.

A meta-analysis for dose-dependent efficiency of BTX in CAF [6] involved 34 prospective studies (1577 patients) taken from PubMed and Web of Science databases (published before May 2015). Total BTX units ranged from 5 to 150U and the efficiency across analyzed studies ranged from 33 to 96%. Spearman's rank correlation test was used to perform calculations regarding dose-dependencies. Majority (91.2%) involved injections at internal sphincter, usually at 2 sites. Mean volume of injection was 0.2-1.0 ml per session. Follow-up duration ranged from 4 to 156 weeks. Resolution time ranged from 1 to 8 weeks. Transient faecal incontinence noted in 5.01%. The study showed no dose-dependent efficiency. Moreover, postoperative incontinence rate was unrelated to BTX dosage. There was no difference in healing rates in regard to site and number of injections per session.

Figure 1



Figure 2



Figure 4



Figure 3



Figure 5



Figure 6



Figure 7

Conclusion

This article reviews the studies which have evaluated BTX-A injection in CAF management through various aspects including its efficacy (short-term and long-term), pain relief, safety, role of patient factors, improvement in quality of life, and dose-dependent efficiency. Patients in recent studies were given BTX-A injections with dosages ranging from 25U-100U mainly into the internal anal sphincter at 2-3 spots. Short-term and long-term follow-up has shown a success rate of 64.8% to 86.85%. Main side-effect was transient faecal incontinence with incidence of 8.6% to 13.2%. These findings are comparable to the former meta-analytic study [6], which further concludes that the efficiency and postoperative incontinence rate is not dose-dependent. Moreover, the healing rates remain similar regardless of the site and number of injections per session. Although it's a safe and effective minimally invasive treatment for CAF with failed conservative management, there is significant long-term treatment failure.

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