

# Hydrogen Peroxide Injection Followed by Methylene Blue Into External Openings of Perianal Fistulae: A New Simple Method of Track Delineation

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**ABSTRACT.** Perianal fistula is common in Saudi Arabia, the most common predisposing cause being an anal gland abscess. Although tuberculosis and inflammatory bowel disease are not rare in this part of the world, they contribute little to the aetiology of anal fistulae. Delineation of the tract is the central step in proper tract excision that allows for permanent cure with minimal recurrence. The use of dyes in this respect is well-known, but the combined injection of hydrogen peroxide followed five minutes later by methylene blue through the external orifices of the fistula was not used before. In this study, which was done during the period from January 1995 to December 1997, 60 patients having fistula-in-ano were selected randomly, and this method was applied to them which helped in complete tract visualization and excision. In the present series 84% of the patients were males, with a mean age of 35.6 years. Most were Saudi citizens (89%). The type of fistula was low in 83% of the cases. None of the patients had any of the specific granulomatous disease. Twelve patients (22%) gave a history of previous surgery for the same lesion with recurrence. The follow-up period was 35 months. There were 3 recurrences (5%); all were diabetics.

**Keywords:** Fistula-in-ano; Hydrogen peroxide; Methylene blue; Tract identification.

## Introduction

Fistula-in-ano is a common surgical problem that dates back to the earliest times of

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medical records (Wilson 1963). Its management was always controversial and the results were closely linked to the experience of the surgeon and his proper understanding of the complex anatomy of the anal region.

The majority of cases of anal fistula are low. However, a significant number are high or anatomically complex and may impose a difficult surgical problem. Perianal sepsis (usually anal gland abscess) is the most common predisposing cause; however, a significant portion remains to be idiopathic<sup>[1]</sup>. Fistulae tend to be high and anatomically complex. In Crohn's disease it is associated with multiple protracted fistulous formation, especially in females<sup>[2]</sup>. Perianal fistulae are also manifestations of intestinal tuberculosis. Other specific infections like schistosomiasis<sup>[3]</sup> and actinomycosis<sup>[4]</sup> are rare causes of perianal fistulae.

There have been many reports of peri-anal fistulae and abscesses in infants, the cause of which is most likely a developmental anomaly of the cloacogenic zone of the anal canal leading to the formation of irregular, thickened dentate line with deep crypts (of Morgagni) which harbours infection and leads to cryptitis<sup>[5]</sup>. The presence of columnar, transitional, and stratified squamous epithelium lining the tracts of fistulae excised from these cases supports this view<sup>[6,7]</sup>.

Elimination of the fistula depends on identification of the tract during surgical excision. Several methods were tried to identify the tract with its extension, including radiological and transrectal ultrasound, MRI<sup>[8]</sup>, and use of a dye and chemicals, *e.g.* methylene blue and hydrogen peroxide.

The aim of this study is to present the experience with the use of injection of hydrogen peroxide before methylene blue which is showing better visualization and identification of the fistula tract and its extension.

### **Patients and Methods**

Between January 1995 and December 1997, a prospective study involving 60 cases of fistula-in-ano was conducted. All patients were surgically treated. The patients were chosen at random from the outpatient clinic of King Abdulaziz University Hospital. The age range was between 4 months to 77 years; the mean age was 35.6 years. There were 50 males (83%) and 10 (17%) females. Most of the patients were Saudi nationals (46.6%) (Table 1).

As possible predisposing causes, 8 (13.3%) patients were diabetics, 11 (18%) had chronic constipation, and 14 (23%) had previous anal surgery. All these had high fistulae. In this series, no patient had inflammatory bowel disease (IBD) or tuberculosis (TB). The duration of symptoms varied from 6 weeks to 8 years. Patients were followed for 14 months to 5 years; the average follow-up was 35 months. The fistulae were classified as follows: subcutaneous; inter-sphincteric; trans-sphincteric; extra-sphincteric. Within each group, the fistula was considered either high or low according

to the level of internal opening (*i.e.*, supra- or infra-levator). The data obtained and included in the analysis were as follows: age; nationality; sex; duration of symptoms; and the presence or absence of important predisposing factors like diabetes mellitus, chronic constipation, previous operation, specific granulomatous infection, or IBD.

After anaesthesia and positioning, hydrogen peroxide 3% was injected using a small cannula slowly into all the visible openings. This was followed 5 minutes later by injection of concentrated methylene blue. The surgical procedure was then completed as appropriate. All the removed fistulous tracts were sent for histopathological examination.

TABLE 1. Nationalities.

Nationality	Number
Saudi	28
Yemeni	15
Egyptian	3
Palestinian	5
Pakistani	2
Eritrian	3
Sudanese	4
<b>Total</b>	<b>60</b>

## Results

According to the operative finding, the type of fistula is shown in Table 2 subcut. Low fistula were the most common in 53 patients (88%). High inter-sphincteric fistulae were found in 7 patients (11.6%), while extra-sphincteric were in 2 patients.

TABLE 2. Type of fistulae according to anatomical type.

Fistula Type	Low	High	Total
Subcutaneous	30 (50.0%)	---	30 (50.0%)
Inter-sphincteric	9 (15.0%)	5 (8.4%)	14 (23.4%)
Trans-sphincteric	7 (11.6%)	---	7 (11.6%)
Extra-sphincteric	7 (11.6%)	2 (3.4%)	9 (15%)
<b>Total</b>	<b>53 (88.2%)</b>	<b>7 (11.6%)</b>	<b>60</b>

The fistulae were of the low type in 53 patients (88.2%, mostly subcutaneous), but in 7 (11.6%) they were high (mostly inter-sphincteric (8.4%)), and 2 (3.4%) were extra-sphincteric (Table 2). Three patients (5%) had recurrence; all were recurrent patients of high inter-sphincteric fistulae in diabetics. Histopathological examination showed non-specific chronic inflammation consistent with fistula tract.

## Discussion

Fistula-in-ano, particularly the low type, is a common surgical problem which might be idiopathic in nature due to local infection of the anal glands or secondary to the chronic IBD or TB. The histopathological examination of the excised tract of the patients in this study exclude the possibility of TB or IBD. The standard surgical method in the treatment of the fistula-in-ano is by the “laying open technique”. The success in curing the condition of the fistula requires full excision of the fistula tract and any possible extension.

Several methods have been used for identification of the tract, including proctoscopy, fistulography, transrectal ultrasound, and MRI<sup>[8]</sup>. The use of dyes and other chemicals, *e.g.*, methylene blue and hydrogen peroxide, is well-known. Radiological examination after injecting Lipiodol as a contrast medium is not very convincing to most surgeons. Parks in 1961 used a weak solution of a dye at the time of surgery, injected forcibly through the external opening to localize the site of the offending gland internally.

None of the previous reports indicated the use of hydrogen peroxide in combination with methylene blue which the author used on the patients of this study. He found this combination gives better visualization and identification of the fistula tract as hydrogen peroxide helps in opening the tight small tract by distending the fistula tract by release of the gas bubbles. The author observed that by injection of hydrogen peroxide followed by injection of methylene blue, a coagulum of stained mucous is formed on the wall of the fistula tract without diffusion of methylene blue outside the tract to the surrounding tissue. This gives sharp delineation of the fistula tract with its extension, thus decreasing the chance of false passage formation and the recurrence, which was seen in 3 (5%) of the patients who were diabetic. This recurrence rate is low compared to previous published studies<sup>[9]</sup>.

Previous surgery is associated with difficulties in identifying the trans-sphincteric tracts or supra- and extra-sphincteric tracts, consequently followed by a high recurrence rate<sup>[11]</sup>. This confirms with the pattern of the presented patients. However, it is a notable feature that the secondary perianal fistula (IBD and TB) was not encountered in this series, although TB and IBD are known clinical encounters in this part of the world.

Males are more frequently affected than females<sup>[10]</sup>. This is the observation in this study but in this series, women do not seem to have complex fistula patterns as described by other reports<sup>[11]</sup>.

## Conclusion

Perianal fistula is a common surgical problem. Certain factors seem to render treatment difficult. Proper tract visualization and complete excision are the cornerstones in

complete cure and minimizing recurrence. In this study, the use of hydrogen peroxide prior to the injection of methylene blue has remarkable benefits in delineating the anatomy of the tracts and making complete surgical excision easier, as seen in the presented series.

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## حقن بروكسيد الهيدروجين يتبعه أزرق الميثيل في الفتح الخرجي للناسور الشرجي، طريقة بسيطة وجديدة للتخطيط

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المستخلص. الناسور الشرجي مرض شائع في المملكة العربية السعودية، حيث يعتبر عدم وجود غدة شرجية من أكثر الأسباب شيوعاً. مع أن التدرن ومرض التهاب الأمعاء ليسا من الأمراض النادرة في هذا الجزء من العالم، لكنهما لا يساهمان في شرح أسباب الناسور الشرجي. تخطيط المجرى هو الخطوة الأساسية لإجراء الاستئصال بالطريقة المثلى، للحصول على الشفاء التام والتقليل من عودة المرض إلى الظهور. إن استخدام الصبغات في هذا الشأن يعد أمراً معهوداً، لكن لم يتم سابقاً استخدام طريقة الجمع بين حقن بروكسيد الهيدروجين يتبعه بخمس دقائق الحقن بأزرق الميثيل في فتحة الناسور الخارجية. في هذه الدراسة التي أجريت في الفترة من يناير ١٩٩٥ إلى ديسمبر ١٩٩٧، تم اختيار ٦٠ مصاباً بالناسور، اختياراً عشوائياً وتم استخدام هذه الطريقة مما ساعد على تصوير واستئصال المجرى بالكامل. في المجموعة الحالية كان ٨٤٪ من المصابين من الذكور ومتوسط العمر ٦, ٣٥ وكانوا في الغالبية من السعوديين (٨٩٪). كانت حالات الناسور بسيطة لدى ٨٣٪ من الحالات. لم يعاني أي من المصابين من مرض الأورام الحبيبية. أظهر ١٢ مصاباً تاريخاً مرضياً سابقاً بنفس الإصابة وخضوعهم للجراحة مع عودة ظهور المرض بعد الجراحة. استمرت فترة المتابعة ٣٥ شهراً. عاد المرض للظهور في ٣ حالات (٥٪) كانت كلها تعاني من داء السكري.