Recurrence Pattern of Fistula-in-Ano in a Chinese Population

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Abstract

Background and aims: Fistula-in-ano is a common colorectal complaint. Despite of the advancement in preoperative imaging and surgical techniques, recurrence is not uncommon in this disease entity. We aimed to determine the recurrence pattern and predictors of FIA in Chinese population. Methods: Setting: single regional hospital serving a 300,000 population. Design and Participants: A systematic retrospective review of inpatient and follow up records and operation records in patients with diagnosis of fistula-in-ano (ICD code - 565.1) from January 2001 to December 2004 was performed. Intervention: Surgery for fistula-in-ano. Results: 135 out of 137 Chinese patients received anal fistula operations. 14 patients (10.4%) had high type anal fistulas and 27 patients (20%) had perianal sinus. The most common operation was combined fistulotomy-fistulectomy (78 patients, 57.8%). 18 patients (13.3%) had recurrence with a median time to recurrence of 7.5 months. Six factors including: 1) positive history of perianal abscess, 2) previous perianal operation, 3) complex fistula, 4) perianal sinus, 5) absence of an internal opening, 6) surgical procedure of sinus tract excision were significantly associated with recurrence in univariate analysis. Sinus tract excision was the only independent factor to predict recurrence in logistic regression (p=0.002, 95%CI=1.29-3.27). Conclusion: Fistula-in-ano carried a significant risk of recurrence in perianal sinus with sinus tract excision performed. No difference was found between Chinese and Caucasian in recurrence pattern of fistula-in-ano.

Key words: Fistula-in-ano – recurrence – endoanal ultrasound

Introduction

Fistula-in-ano (FIA) is one of the most common benign anal conditions in daily surgical practice. It is defined as an epithelized abnormal tract connecting two surfaces, usually the rectal mucosa and perianal skin [1]. Low type fistula accounts for the majority of cases up to 90% [2]. Most of the anal fistulas run a benign course, but complicated FIA still carries significant morbidity, namely fecal incontinence and recurrence. Despite the advancement in preoperative road mapping of fistula tracts by magnetic resonance imaging (MRI) and endoanal ultrasound (EAUS) [3-4], there is a significant recurrence rate of 4% up to 45% [5-10]. Modification of conventional surgical treatment for closure of fistula tract by primary closure, endorectal advancement flap, fibrin glue injection and fistula plug has been extensively investigated in the prevention of recurrence [11-14]. The results regarding reduction of recurrence are not impressive. Either recurrence is due to the natural history of the disease itself, or the choice of surgery has not been clearly identified in past literature.

In this retrospective study we aimed to investigate surgical outcomes of patients receiving surgery for FIA, and identify the pattern and predictors of recurrence in a Chinese population.

Patients and methods

This was a retrospective study in a regional hospital. Between January 2001 and December 2004, patients with the diagnosis of FIA (ICD 9 code of 565.1) were retrieved from Clinical Data and Report system (CDARS) computer database of Hong Kong Hospital Authority. Their hospital records were reviewed systematically. Anal fistulas are classified according to Parks et al, namely intersphincteric, transphincteric, suprasphincteric and extrasphincteric type [1]. Subcutaneous fistula that is not included in the original Parks classification is described as low type fistula. Complex fistulas are defined as high transphincteric or intersphincteric (concerning more than 50% of internal...
and presence of recurrence were retrieved from the patients’
during follow up. 2) new external opening was found
healing failed with persistent external opening found 8
were diagnosed as recurrent FIA if: 1) complete wound
in the outpatient clinic four weeks after surgery and then
were prescribed upon discharge. All patients were examined
once they were ambulatory and able to manage the wound
for histopathological examination. Patients were discharged
of anal sphincters and rectal mucosa. All specimens were sent
sinus tract, the whole tract was cored out with preservation
excised and laid open to rectal mucosa. In the high lying
identify the internal opening, the low lying sinus tract was
later. When an abscess was found intraoperatively, drainage
suture was then inserted to the remaining fistula tract as a
internal opening. A monofilament nonabsorbable nylon
depending on the choice of surgeons. In high type fistulas,
distal fistula tract was excised after identification of the
opening was performed by
hydrogen peroxide injection and gentle insertion of a probe
with blunted end. Fistulectomy, fistulotomy or combined
fistulotomy-fistulectomy was performed in low type fistulas,
during operation, low type fistulas are defined as low
were defined as those with no internal opening identified
during operation, low type fistulas are defined as low
transspincteric or interspincteric and subcutaneous fistulas,
while high type fistulas are defined as high transspincteric or
interspincteric, extrasphincteric fistulas.

Preoperative assessment
Clinical diagnosis of FIA was based on the patients’
complaint of perianal discharge and positive identification of
external opening in digital rectal examination. Surgery was
directly offered to patients with simple FIA. Selective
preoperative MRI was offered to patients who were
uncertain of fistula tract anatomy in clinical examination.
Standardized MRI techniques with gadolinium enhanced T1-
weighted and T2-weighted axial and coronal cut, short tau
inversion recovery (STIR) and fat suppression was utilized.
Colonoscopy was performed in patients with suspected
perianal Crohn’s disease.

Surgical interventions
Surgery was performed or supervised by colorectal
surgeons. All patients received examination under anesthesia
(EUA) spinal or general in lithotomy position. Intraoperative
identification of internal opening was performed by
hydrogen peroxide injection and gentle insertion of a probe
with blunted end. Fistulectomy, fistulotomy or combined
fistulotomy-fistulectomy was performed in low type fistulas,
depending on the choice of surgeons. In high type fistulas,
distal fistula tract was excised after identification of the
internal opening. A monofilament nonabsorbable nylon
suture was then inserted to the remaining fistula tract as a
non-cutting loose seton. EUA was repeated three months
later. When an abscess was found intraoperatively, drainage
and curettage was performed. In patients where we failed to
identify the internal opening, the low lying sinus tract was
excised and laid open to rectal mucosa. In the high lying
sinus tract, the whole tract was cored out with preservation
of anal sphincters and rectal mucosa. All specimens were sent
for histopathological examination. Patients were discharged
once they were ambulatory and able to manage the wound
as an outpatient.

Postoperative care
Potassium permanganate Sitz bath and oral analgesia
were prescribed upon discharge. All patients were examined
in the outpatient clinic four weeks after surgery and then
there was a yearly follow up after wound healing. They
were diagnosed as recurrent FIA if: 1) complete wound
healing failed with persistent external opening found 8
weeks after surgery, or 2) new external opening was found
during follow up.

Statistical analysis
Data on 8 preoperative variables, four operative variables
and presence of recurrence were retrieved from the patients’
records. Preoperative variables included sex, past history of
perianal abscess, previous perianal operations, past history of
Crohn’s disease, tuberculosis, diabetes mellitus, preoperative
MRI mapping and classification of simple or complex fistula.
Operative variables included type of fistulas, identification of
internal opening, operative procedures and operative findings
of abscess formation. All patients’ records and follow up
notes were reviewed until June 2007.

Statistical calculation was performed with SPSS 12.0
for windows. Chi square or Fisher’s Exact test were used
to analyse the association between recurrence and nominal
variables as appropriate. Logistic regression was performed
on significant variables to determine independent predicting
factors. A p-value of <0.05 was counted as significant.

Results
Patients’ characteristics
A total of 137 patients with FIA were identified with
135 patients receiving operations between January 2001 and
December 2004. 118 were males while 19 were females.
The mean age was 44.2 (SD 12.8). Colonoscopies were
performed in 7 patients with one of them diagnosed to
have Crohn’s disease. Nine patients (6.7%) had a history
of diabetes mellitus and three patients (2.2%) had Crohn’s
disease. Mesalazine was prescribed to all patients with
Crohn’s disease; one patient had additional prednisolone and
another patient had additional azathioprine. None of them
were put on infliximab. 42 out of 135 patients (31%) had
previous operations for a perianal abscess. Seven patients
(5.2%) had had previous anal fistula surgery before the first
consultation. 111 patients (82.2%) underwent operation
without preoperative imaging. 21 patients had preoperative
MRI mapping and three patients had CT fistulogram before
operation. Significantly more preoperative imaging was
performed in patients with previous perianal operations
compared with patients with a first attack (19/49 versus
5/86, p<0.0001).

Operative findings
Ninety-four patients (69.6%) had low anal fistulas and
14 patients (10.4%) had high anal fistulas. Internal opening
could not be identified in 27 patients (20%) and they
were labeled as perianal sinus: 21 out of these 27 patients
received sinus tract excision, 6 patients received combined
fistulotomy-fistulectomy with the tract laid open through
the rectal mucosa at the level of sinus tract. One patient had
horseshoe type high anal fistula. An abscess was found in 8
patients (5.9%) intraoperatively. Operative procedures are
summarized in Table I. The most common operation was
combined fistulotomy-fistulectomy (78 out of 135 patients,
57.8%). When the findings in MRI and EUA were compared,
EUA agreed with MRI in 16 out of 21 patients (76%).
Seton placement with or without partial fistulectomy
was performed in 9 patients. Two out of these 9 patients
required long term seton placement, where one had Crohn’s
disease and the other had multiple high anal fistulas. Five patients received subsequent fistulotomy with no further recurrence. One patient developed recurrence six months after seton removal and tissue glue injection. One patient defaulted follow up after operation. A total of 129 specimens were sent for histopathological examination. Two patients (1.5%) were found to have tuberculosis. The rest were all benign pathologies.

Pattern and predictors of recurrence

The overall recurrence rate was 13.3% (18/135). Sixteen patients were males and two patients were females. None of the three patients with Crohn’s disease had suffered from recurrence, with one of them on long term seton. Internal opening could only be identified in three patients. Excision of sinus tract was performed in 15 patients. The median time to recurrence was 7.5 months, ranging from 3 to 50 months. Four out of 18 patients refused re-operation, where 3 of them had spontaneous healing of the fistula tract and one patient defaulted follow up. Fistulotomy-fistulectomy was performed as a second operation in 8 patients. Excision of sinus tract was performed in 4 patients as an internal opening was not found intraoperatively. No further recurrence was found in these 12 patients, at a mean follow up of 40.5 months. Abdominoperineal resection was then performed.

Preoperative and operative variables were included in univariate analysis to study the relation with recurrence (Table II). Presence of Crohn’s disease, tuberculosis, diabetes mellitus, preoperative MRI mapping were not associated with recurrence. In sub-group analysis of patients with MRI performed, agreement between MRI and EUA was not associated with recurrence (Table IIa). Six factors including positive history of perianal abscess, previous perianal operation, complex fistula, perianal sinus, lack of identification of internal opening, surgical procedure of sinus tract excision were significantly associated with recurrence. Sinus tract excision was the only independent factor to predict recurrence in logistic regression analysis (Table III).

Discussion

Fistula-in-ano is one of the most common benign colorectal diseases, with significant risk of morbidity and recurrence. A number of factors were identified to be associated with recurrence in our series, while the surgical procedure of sinus tract excision was the only independent risk factor. Our findings are similar to those published in Caucasians. In a retrospective study of 624 patients with FIA, lack of identification of an internal opening was found to be a significant factor associated with fistula recurrence [6]. In another study of 523 fistulas, 53.3% of recurrent fistulas were accounted by missed internal opening at initial surgery [15]. In our series, 27 out of 135 patients had no internal

| Table I. Type of operations performed in fistula-in-ano |
|-----------------|-----------|
| Fistulectomy    | 15        |
| Fistulotomy     | 3         |
| Combined fistulectomy-fistulotomy | 78 |
| Partial fistulectomy-fistulotomy | 7 |
| Excision of sinus tract | 22 |
| Seton placement +/- partial fistulectomy | 9 |
| Loop colostomy  | 1         |

| Table IIa. Preoperative variables in relation to recurrence |
|-----------------|-----------|-----------|-----------|--------|
| Preoperative variables | Recurrence | No recurrence | p value |
| Sex              | Male      | 16         | 100       | 1.0    |
|                 | Female    | 2          | 17        |        |
| Crohn’s disease  | Present   | 0          | 3         | 1.0    |
|                 | Absent    | 18         | 114       |        |
| Tuberculosis     | Present   | 0          | 2         | 1.0    |
|                 | Absent    | 18         | 115       |        |
| Diabetes Mellitus| Present   | 2          | 7         | 0.343  |
|                 | Absent    | 16         | 110       |        |
| Pre-operative MRI| Performed | 4          | 17        | 0.48   |
|                 | Not performed | 14       | 100       |        |
| EUA findings agreed with MRI | yes | 4          | 12        | 0.21   |
|                 | no        | 0          | 5         |        |
| Previous perianal operation | yes | 11         | 38        | 0.019  |
|                 | no        | 7          | 79        |        |
| History of perianal abscess | yes | 10         | 32        | 0.016  |
|                 | no        | 8          | 85        |        |
| Classification   | Simple    | 6          | 77        | 0.008  |
|                 | Complex   | 12         | 40        |        |

| Table IIIb. Operative variables in relation to recurrence |
|-----------------|-----------|-----------|-----------|
| Factors          | Recurrence | No recurrence | p value |
| Type             | Sinus      | 13         | 14        | <0.001  |
|                 | Low        | 3          | 91        |         |
|                 | High       | 2          | 12        |         |
| Internal opening | Identified | 5          | 103       | <0.001  |
| Operation types  | Fistulectomy          | 2          | 13        | <0.001  |
|                 | Fistulotomy           | 0          | 3         |         |
|                 | Fistulotomy + excision of fistula tract | 2          | 76        |
|                 | Fistulotomy with partial excision of fistula tract | 0          | 7         |
|                 | Excision of sinus tract | 13         | 9         |
|                 | Seton placement +/- partial fistulectomy | 1          | 8         |
|                 | Loop colostomy        | 0          | 1         |
| Abscess during surgery | Present | 2          | 6         | 0.29    |
|                 | Absent               | 16         | 111       |         |
opening identified during the operation but only 21 patients (77.8%) had sinus tract excision. The rest had the low lying sinus tract laid open through the rectal mucosa to the level of sinus tract, where the missing internal opening was assumed to be there. None of these six patients developed recurrence. This probably explains why the lack of identification of an internal opening was not an independent risk factor.

Perianal sinus is diagnosed in patients with the lack of identification of an internal opening intraoperatively. To avoid the diagnosis of perianal sinus and subsequent procedure of sinus tract excision, effort is put on preoperative localisation of the internal opening by EAUS or MRI. MRI has the sensitivity and specificity of 96% and 90% for detecting the internal opening [16]. A therapeutic impact of 10% with alternation of surgical approach by MRI was found in primary FIA [17]. MRI is also beneficial in case of recurrent fistulas. Surgery for recurrent FIA guided by MRI can reduce further recurrence by 75% [18]. Surprisingly, MRI was not significantly related to recurrence in our series. This may be due to our selective use of MRI instead of routine use in all anal fistulas. Endoanal ultrasound is the other alternative imaging for anal fistulas. In a study comparing MRI and hydrogen peroxide-enhanced EAUS in evaluation of perianal fistulas, both had good agreement, especially for classification of the primary fistula tract and the location of an internal opening [19]. A low recurrence rate of 2% was reported in case of routine use of EAUS [20]. Based on our findings in univariate analysis, high risk patients should be offered MRI. These include patients with complex fistula, history of perianal abscess with or without perianal surgery.

While preoperative MRI road mapping or EAUS can give important information on the anatomy of anal fistulas, MRI and EUA only agreed in 55% of patients [17-18]. Even if an internal opening is found in MRI, it may not be localised during EUA. Intraoperative identification of internal opening is still required to delineate the fistula tract. In our series, 8 out of 18 patients with recurrent anal fistulas (44.4%) were found to have an internal opening in re-operation, which was probably missed in the first operation. Intraoperative identification of internal opening relies on hydrogen peroxide injection through external opening and EUA by a blunt-tip probe. The absence of gas from hydrogen peroxide enhancement does not necessarily mean the absence of an internal opening. In a study comparing EAUS versus hydrogen peroxide-enhanced EAUS, only 44% of internal openings showed gas from hydrogen peroxide enhancement [21]. The use of intra-operative EAUS may help to improve the accuracy of EUA in localization of obliterated internal openings and perform appropriate surgery [22]. In patients with the final diagnosis of perianal sinus, low type should be laid open as fistulotomy. In high lying transphincteric perianal sinus, excision of sinus tract with part of rectal mucosa where a suspected obliterated internal opening is located, with seton insertion, may reduce the incidence of recurrence. Regular follow up is essential to evidence recurrence in the intersphincteric type of perianal sinus.

To conclude, FIA carries a significant risk of recurrence. Preoperative MRI may help to localize the internal opening and should be performed in all complex fistulas. The excision of the sinus tract is the single independent predictor of anal fistula recurrence. There is no difference between Chinese and Caucasians in the recurrence pattern. A high index of suspicion should be raised in the operative diagnosis of perianal sinus. Regular follow-up in patients with perianal sinus is required to monitor recurrence.

Conflicts of interest

None to declare.

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