SCIENTIFIC ARTICLE

Do we need a new classification for fistula-in-ano?

E. M. U. J. B. Ekanayake, H. M. S. R. B. Kotakadeniya
Faculty of Medicine, University of Peradeniya, Sri Lanka

Keywords: Fistula-in-ano; perianal fistula classification; Parks; Goodsall's

Abstract

Introduction

Identification of correct anatomy of the fistulous tract is important in the treatment of fistula-in-ano. Several classifications are available for this. Our objective was to identify the differences in the anatomy of fistula-in-ano in patients been treated at our hospital and compare it with commonly used classifications, namely Parks and St James University Hospital (SJUH) classifications.

Materials and Methods

Fifty one consecutive patient with diagnosed cryptoglandular fistula-in-ano were recruited from August 2017 to January 2020. All were examined under spinal or general anaesthesia by two experienced colorectal surgeons. Gentle probing with a fistula probe and injection of saline / Hydrogen peroxide was used to identify the internal opening and primary tract.

Results

There were 41 male patients and 10 female patients. Their median age was 42 years. Thirty-four (66.7%) had transsphincteric fistula, 11 (21.6%) had intersphincteric, 4 (7.8%) had superficial and only 2 (3.9%) had suprasphincteric fistula. Out of all 15 (29.4%) were high fistula-in-ano while the remaining 36 (70.6%) were low.

Discussion

Majority of tracts were transsphincteric. This is in contrast to Parks original observation where intersphincteric type made the majority. Superficial fistulae accounted for 7.8%, which were not described in Parks original study. Parks and SJUH classification have not considered the length of external anal sphincter involvement in their classifications, which is crucial in surgical decision making. In our study, 29.4% were high fistula-in-ano.

Conclusion

Majority was transsphincteric and this contradicts Parks and SJUH classification. High fistula-in-ano comprises 29.4%, where treatment modality has major implications. Parks and SJUH classification do not take this into account and the need for a new classification is stressed upon.

Introduction

Fistula-in-ano is common in surgical practice. Its prevalence is 8.6 per 100,000 population. This shows a male predominance with a male-to-female ratio is 1.8:1. The fistula tract can be defined as an abnormal communication, which connects the internal opening in the anal canal to an external opening on the perineal or buttock skin. These tracts are the chronic manifestations of the crypto glandular disease. Initial infection and abscess formation of occluded anal gland erode into skin forming a fistula tract. Secondary etiologies for fistula-in-ano include Crohn's disease, lymphogranuloma venereum, HIV infection, tuberculosis, foreign bodies, radiation proctitis and sometimes actinomycosis.

It is imperative in fistula surgery to know the exact anatomy. Most of the time external opening is obvious but finding the internal opening is challenging. It is vital to identify both openings to identify the course of the tract. Several classifications exist to guide the clinician to identify the correct anatomy of the tract. The most frequently used classification of anal fistulae is the classification described by Parks, Gordon and Hardcastle.

Goodsall's rule was introduced by David Henry Goodsall to define the route of an anal fistula. This states that, if the external opening of the fistula is located posterior to the transverse anal line, the internal opening is most probably situated in the dorsal midline, whereas if the external opening is located anterior to the transverse anal line, the tract probably connects directly to the internal opening located in the nearest crypt. This has been challenged in recent times with some conflicting data regarding predictive accuracy. [1,2, 12].

The objective of our study was to assess the anatomical distribution of perianal fistula present to the Teaching Hospital Peradeniya and compare it with commonly used

Correspondence: E. M. U. J. B. Ekanayake
E-mail: emujbe@yahoo.com
https://orcid.org/0000-0003-1906-8040
Received: 30-04-2021 Accepted: 27-06-2021
DOI: http://doi.org/10.4038/sljs.v39i2.8780

classifications like Parks classification and St James University Hospital (SJUH) classification [3,4].

Methods

A prospective observational study was performed on patients with diagnosed cryptoglandular fistula-in-ano from August 2017 to January 2020 at Teaching Hospital, Peradeniya.

Patients above 18 years of age who were diagnosed with cryptoglandular fistula-in-ano were recruited in the study after obtaining informed written consent. Patients with recurrent fistulae and secondary fistulae due to other causes were excluded from the study.

All the patients were examined under spinal or general anaesthesia by two experienced colorectal surgeons. Gentle probing with a fistula probe and injection of saline/Hydrogen peroxide was used to identify the internal opening and primary tract. External opening, internal opening, primary tract, presence of horseshoeing, presence of abscess and other associated conditions like haemorrhoids, fissures etc. were documented.

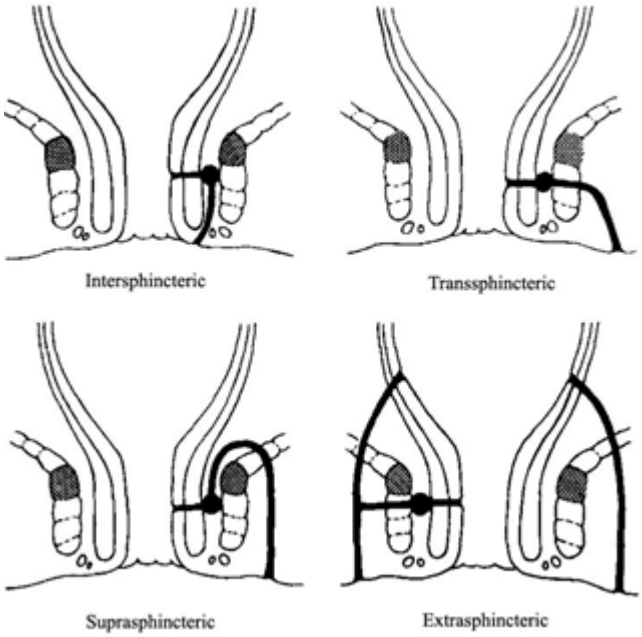

Figure 1. Types of fistulae-in-ano according to Parks classification

Table 1. Type of fistula tract

Type of fistula tract	Number (%)
Superficial / Unclassified in Parks	4 (7.8%)
Intersphincteric	11 (21.6%)
Transsphincteric	34 (66.7%)
Suprasphincteric	2 (3.9%)
Extrasphincteric	0 (0%)

Results

There were 41 male patients and 11 female patients. Their median age was 42 years (range 18 to 80 years). When Parks classification (Figure 1) is used on the study group, 66.7 % had transsphincteric fistula, 21.5% had intersphincteric, 7.8% had superficial and only 4 % had suprasphincteric fistula (Table 1).

Out of 51 fistulae, one had two internal openings the rest had only one internal opening. The majority, 32 (61.5%) were located at the 6 o'clock position in the posterior midline. Positioning of internal opening in relation to the transverse

Table 2. Positioning of the internal opening in relationship to the transverse anal line.

Position of internal opening	Number (%)
Anterior to transverse anal line	11 (21.1%)
Posterior to transverse anal line	34 (65.4%)
On the transverse anal line	7 (13.5%)

Table 3. Positioning of the internal opening in clock positions.

Clock position of internal opening	Number (%)
1	2 (3.8%)
2	2 (3.8%)
3	3 (5.9%)
4	0 (0%)
5	2 (3.8%)
6	32 (61.5%)
7	0 (0%)
8	0 (0%)
9	4 (7.5%)
10	1 (1.9%)
11	3 (5.9%)
12	3 (5.9%)

Table 4. Positioning of the external opening in relationship to the transverse anal line.

Position of the external opening	Number
Anterior to transverse anal line	18
Posterior to transverse anal line	32
On the transverse anal line	7

anal line is given in Table 2. and clock positioning is given in Table 3.

Forty seven fistulae tracts had only one external opening while two had two external openings and another two had three external openings. Most frequent (19.3%) location of external opening was at 6 o'clock position and next frequent position (17.5%) was at 5 o'clock. Positioning of external

Table 5. Positioning of the external opening in clock positions.

Clock position	Number (%)
1	4 (7%)
2	6 (10.4%)
3	4 (7%)
4	5 (8.8%)
5	10 (17.5%)
6	11 (19.3%)
7	3 (5.3%)
8	3 (5.3%)
9	3 (5.3%)
10	3 (5.3%)
11	5 (8.8%)
12	0 (0%)

opening in relationship to the transverse anal line is given in Table 4. and clock positioning is given in Table 5.

Horseshoeing of the tract was noted in 25 tracts while the rest

Table 6. Plane of horseshoeing

Plane of horseshoeing	Number (%)
No horseshoeing	26 (51%)
Intersphincteric	5 (9.8%)
Infralevator	20 (39.2%)
Supralevator	0 (0%)

Out of 51 fistulae tracts studied 22 (43.1%) had associated abscesses or cavities. Location of abscesses or cavities are shown in Table 7.

Table 7. Plane of horseshoeing

Plane of the abscess / cavity	Number (%)
No abscess / cavity	29 (56.9%)
Superficial	1 (1.96%)
Intersphincteric	4 (7.84%)
Infralevator	17 (33.3%)

Parks classification of 22 fistulae tracts which were associated with abscesses or cavities are given in Table 8.

Table 8. Parks classification of fistulae tracts which were associated with abscesses or cavities

Type of fistula according to Parks classification	Number (%)
Superficial	1 (4.5%)
Intersphincteric	3 (13.6%)
Transsphincteric	17 (77.4%)
Suprasphincteric	1 (4.5%)
Extrasphincteric	0 (0%)

St James University Hospital classification considers the presence of abscesses in relationship to the fistula tract in classification of fistulae-in-ano. (Table 9) Classification of fistulae tracts of our study group according to SJUH classification is given in Table 10.

Table 9. SJUH classification

Grade	Description
1	Intersphincteric fistula with no abscess or secondary tract
2	Intersphincteric fistula with associated abscess or secondary tract
3	Transsphincteric fistula
4	Transsphincteric fistula with associated abscess or secondary tract
5	Supralevator or translevator fistula

Table 10. Classification of fistulae tracts of our study group according to SJUH classification

SJUH classification	Number (%)
Unclassified	4 (7.8%)
Grade 1	8 (15.7%)
Grade 2	3 (6%)
Grade 3	17 (33.3%)
Grade 4	17 (33.3%)
Grade 5	2 (3.9%)

had no horseshoeing. Plane of horseshoeing is given in Table 6.

Depending on the external sphincter length involved by the fistula tract, fistulae-in-ano can be categorized as high and

Table 11. Distribution of high and low fistulae in different Parks classification groups

	Superficial	Intersphincteric	Transsphincteric	Suprasphincteric	Total
High	NA	NA	13 (25.5%)	2 (3.9%)	15 (29.4%)
Low	4 (7.8%)	11 (21.6%)	21 (41.2%)	NA	36 (70.6%)

low anal fistulae. If the external sphincter involvement is less than one third of the length of the sphincter, it is categorized as a low anal fistula and if the involved external sphincter length is more than one third, it is categorized as a high anal fistula. When this is combined with Parks classification, superficial and straightforward intersphincteric fistulae will be in the low anal fistula category while suprasphincteric and extrasphincteric categories will be in high anal fistula category. Transsphincteric category will have both high and low varieties. Table 11 shows distribution of high and low fistulae in different Parks classification groups in our study.

Table 12. Distribution of fistula tracts in relationship to the anal canal

Quadrant of the anal canal	Number (%)
Anterior right quadrant	6 (11.8%)
Anterior left quadrant	7 (13.7%)
Posterior right quadrant	12 (23.5%)
Posterior left quadrant	22 (43.2%)
Multiple quadrant involvement	4 (7.8%)

Distribution of fistula tracts in relationship to the anal canal is depicted in table 12.

Discussion

In our study majority of fistula primary tracts were transsphincteric (66.7%) and intersphincteric (21.6%) was second in place. This is in contrast to Parks original observation. According to Parks original study, the majority were intersphincteric (45%) while transsphincteric, suprasphincteric and extrasphincteric were 30%, 20% and 5% respectively [3]. Distal to the lower edge of the internal sphincter, the fibres of the lowermost portion of the subcutaneous part of the external sphincter curve in and due to this, on Endoscopic Ultrasound the lower third of the anal canal is devoid of an internal sphincter. Hence intersphincteric fistulae can cross some of these lowest fibres of the external sphincter and become transsphincteric [5]. Our findings are more in line with the findings of et al. from Spain and U Jayarajah et al. from Sri Lanka where the majority of fistulae were transsphincteric [6,7].

A significant number of patients in our study had superficial fistulae (7.8%), which was not described by Parks original study, which maybe because the emphasis was on the intersphincteric plane [3]. This is a major limitation in Parks classification. According to Mark's and Ritchie's publication on experience at St Mark's hospital, published in British Journal of Surgery, superficial fistulae comprised 16%, which is in concordant with our study [8]. Although Parks describes 20% of suprasphincteric fistulae we noted only 3.9% in our study group. According to Mark's and Ritchie's experience, it was only 3% which again tallies with our experience. In our study group, we had no extrasphincteric fistulae while Parks had 5% and Mark and Ritchie had 3%

SJUH classification uses the presence of abscesses or secondary tracts in subdividing Parks intersphincteric into grades 1 and 2 and Parks transsphincteric into grades 3 and 4. At the same time, it amalgamates Parks suprasphincteric and extrasphincteric into grade 5 [4].

Considering the management of perianal fistulae, the challenge is achieving healing of the fistula tract while preserving sphincter function. Laying open of the fistula tract can achieve good healing rates but can result in impaired sphincter function if the tract traverses the external sphincter above one-third of the sphincter length. Such fistulae are categorized as high anal fistulae. In our study out of a total of 51 examined, 15 (12.4%) were high anal fistulae. Having this knowledge during the surgery will help the surgeon in selecting the most appropriate surgical approach. Pre-operative Magnetic Resonance Imaging (MRI) and endoanal ultrasonography are useful assessment tools in this regard [6].

In summary, neither Parks nor SJUH classifications classify perianal fistula with an implication towards surgical treatment options. A classification that considers the thickness of external anal sphincter involvement would provide better guidance for surgeons in selecting appropriate surgical interventions [9].

In this study, Goodsall's rule was true 76.5% of the time (39 out of 51) and this is similar to the findings of U Jayarajah et al. from Sri Lanka [7]. Goodsall's rule was followed by 75% of fistulae with the external opening located at or posterior to the transverse anal line while 80% of fistulae with the external opening located anterior to the transverse anal line followed rule. But this difference was not statistically significant

($p>0.05$). Therefore, in our study group, there was no difference between anteriorly located fistulae and posteriorly located fistulae in following Goodsall's law. Consequently, Goodsall's law can be used to locate the internal opening and to define the path of the tract.

Most of the fistulae tracts, 22 (43.2%) in number were located in the left posterior quadrant of the anal canal. Right posterior, left anterior and right anterior had 12 (23.5%), 7 (13.7%) and 6 (11.8%) tracts respectively while 4 (7.8%) tracts were traversing more than one quadrant. V. Abeysuriya et al. has shown similar distribution earlier [10]. This might be due to the discrepancy in the distribution of anal glands, which are the source of infection in cryptoglandular perianal fistulae, in different quadrants of the anal canal as demonstrated in their study.

Conclusion

In our study majority of fistulae-in-ano were transsphincteric in type. This does not follow Parks original classification that intersphincteric type is the commonest. But our findings follow the pattern shown in previous Sri Lankan studies.

This study population had 29.4% of high anal fistulae where treatment modality has major implications on the outcome of the surgery. Parks and SJUH classification do not take this into account and the need for a new classification is stressed upon.

76.5% of fistulae examined in this study followed Goodsall's rule. This can be used as a guide, to locate the internal opening and to delineate the anatomy of the tract.

The majority of fistulae were in the left posterior quadrant of the anal canal in patients of this study group. These are due to a higher number of anal glands in this region, as pointed by a previous study in Sri Lanka.

All authors disclose no conflict of interest. The study was conducted in accordance with the ethical standards of the relevant institutional or national ethics committee and the Helsinki Declaration of 1975, as revised in 2000.

References

1. Cirocco WC, Reilly JC. Challenging the predictive accuracy of goodsall's rule for anal fistulas. Diseases of the Colon & Rectum [Internet]. Ovid Technologies (Wolters Kluwer Health); 1992 Jun;35(6):537–42. Available from: http://dx.doi.org/10.1007/bf0205053
2. Gunawardhana PAHA, Deen KI. Comparison of hydrogen peroxide instillation with Goodsall's rule for fistula-in-ano. ANZ Journal of Surgery [Internet]. Wiley; 2001 Aug 4;71(8):472–4. Available from: http://dx.doi.org/10.1046/j.1440-1622.2001.02169.x
3 .Parks AG, Gordon PH, Hardcastle JD. A classification of fistula-in-ano. British Journal of Surgery [Internet]. Wiley; 1976 Jan;63(1):1–12. Available from: http://dx.doi.org/10.1002/bjs.1800630102
4. Ozkavukcu E, Haliloglu N, Erden A. Frequencies of perianal fistula types using two classification systems. Japanese Journal of Radiology [Internet]. Springer Science and Business Media LLC; 2011 Jun;29(5):293–300. Available from: http://dx.doi.org/10.1007/s11604-010-0556-4
5. Rickard MJFX. Anal abscesses and fistulas. ANZ Journal of Surgery [Internet]. Wiley; 2005 Jan;75(1-2):64–72. Available from: http://dx.doi.org/10.1111/j.1445-2197.2005.03280.x
6. Garcés-Albir M, García-Botello SA, Espi A, Pla-Martí V, Martin-Arevalo J, Moro-Valdezate D, et al. Three-dimensional endoanal ultrasound for diagnosis of perianal fistulas: Reliable and objective technique. World Journal of Gastrointestinal Surgery [Internet]. Baishideng Publishing Group Inc.; 2016;8(7):513. Available from: http://dx.doi.org/10.4240/wjgs.v8.i7.513
7. Jayarajah U, Samarasekera DN. Predictive accuracy of Goodsall's rule for fistula-in-ano. Ceylon Medical Journal [Internet]. Sri Lanka Journals Online (JOL); 2017 Jun 30;62(2):97. Available from: http://dx.doi.org/10.4038/cmj.v62i2.8474
8. C. G. Marks and J. K. Ritchie, "Anal fistulas at St. Mark's Hospital," Br. J. Surg., vol. 64, pp. 84-91, 1977. https://doi.org/10.1002/bjs.1800640203
9. Garg P. Comparing existing classifications of fistula-in-ano in 440 operated patients: Is it time for a new classification? A Retrospective Cohort Study. International Journal of Surgery [Internet]. Elsevier BV; 2017 Jun;42:34–40. Available from: http://dx.doi.org/10.1016/j.ijsu.2017.04.019
10. Abeysuriya V, Salgado LSS, Samarasekera DN. The distribution of the anal glands and the variable regional occurrence of fistula-in-ano: is there a relationship? Techniques in Coloproctology [Internet]. Springer Science and Business Media LLC; 2010 Oct 15;14(4):317–21. Available from: http://dx.doi.org/10.1007/s10151-010-0648-2
11. Barwood N, Clarke G, Levitt S, Levitt M. FISTULA-IN-ANO: A PROSPECTIVE STUDY OF 107 PATIENTS. ANZ Journal of Surgery [Internet]. Wiley; 1997 Feb;67(2-3):98–102. Available from: http://dx.doi.org/10.1111/j.1445-2197.1997.tb01911.x
12. Goodsall DH, Miles WE. Disease of the anus and rectum.