

Treatment of non-IBD anal fistula

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BACKGROUND

A fistula is defined as an abnormal connection between two epithelial covered surfaces. An anal fistula is an abnormal communication between the epithelialised anal canal and the perianal skin.

Most patients with an anal fistula are between 30 and 50 years of age, and fistulae occur rarely in patients younger than 20 or older than 60. The incidence of anal fistulae is approximately 12 per 100,000 in men and 6 per 100,000 in women [1].

Most anal fistulae originate from cryptoglandular infection, but can also be caused by inflammatory bowel disease, obstetric or other iatrogenic injury, actinomycosis or anorectal cancer.

Park's classification divides anal fistulae into four types [2]: intersphincteric, transsphincteric, suprasphincteric and extrasphincteric. In unselected case series the distribution is as follows:

- An intersphincteric fistula (70% of all fistulae) runs from its internal opening at the dentate line down between the internal and the external anal sphincter in the intersphincteric space. The external opening is usually found in the intersphincteric groove.
- A transsphincteric fistula (25% of all fistulae) passes from its internal orifice, across the intersphincteric plane and through the external anal sphincter, into the ischioanal fossa and out onto the surface of the skin. The external opening is often located at some distance from the anal opening.
- A suprasphincteric fistula (4%) passes from the inner orifice at the dentate line, disperses in a cephalic direction in the intersphincteric plane, passes over the puborectalis muscle and penetrates the levator ani muscle caudally into the ischioanal space to the external orifice

on the surface of the skin.

- As with the transsphincteric fistula, an extrasphincteric fistula (1%) penetrates across the intersphincteric plane through the external sphincter to the ischioanal space. Here, the fistula divides itself into a branch with one arm that passes cephally up through the levator ani muscle and into the rectum, and another arm that passes caudally through the ischioanal space to the external orifice in the skin. The extrasphincteric fistula may simply extend from the internal orifice low in the rectum, through the pelvic floor musculature to the ischioanal space, and with an external orifice on the surface of the skin.

Park's classification does not include any secondary tracts, cavity formation or circumferential, horseshoe-like distribution. This must be described separately.

Treatment of anal fistula depends on the complexity and the location of the fistula tract. From a therapeutic point of view, it is useful to distinguish between low and high anal fistulae. A low fistula involves less than approximately one-third of the external anal sphincter. Furthermore, anal fistula can be categorised as either simple or complex. A simple fistula is usually a low fistula without secondary tracts. Complex fistulae include high primary fistulae tracts, low fistulae in patients with pre-existing incontinence, low fistulae with secondary tracts, horseshoe fistulas and fistulae associated with Crohn's disease and malignancy.

EXAMINATION TECHNIQUES

CLINICAL EXAMINATION

The awake patient

An external fistula opening is often seen as an elevation of granulation tissue with pus secretion. The opening may vary from being a quite discreet, slight punctate skin defect to being a long tumour-like intumescence with a small opening at the tip. Classically, there is a persistent defect in the scar after a previous abscess. It is usually possible to palpate the fistula tract as a string under the skin, running towards the anus in the direction of the internal opening [3]. The internal opening may sometimes feel like a small grain of rice. Exploratory probing of a fistula on an awake patient in order to search the internal opening should not take place as it is painful and could cause the patient a perforation (*via falsa*). An external opening close to the anus (<2 cm) indicates an intersphincteric course, while openings >2 cm from the anus indicate a transsphincteric course. With a suprasphincteric

course, the outer opening is often far from the anus. Usually, the internal opening is not identified using the oblique anoscopy. In the event of non-healing or recurrent fistulae, or further anal lesions and multiple fistulae in the same patient, an investigation for Crohn's disease should be carried out [4] as the disease may debut with anal manifestations several years before intestinal symptoms occur [5,6].

General anaesthesia

The examination is conducted in a gynaecological/lithotomy position and the anal canal is inspected using a speculum. An exploratory probing without resistance is conducted using a blunt probe via the external opening in order to locate the fistula tract. Blunt probes should primarily be used so that it is possible to attach a suture to the tip of the probe for possible placement of a Seton suture. Injection of fluid via the external opening with an infusion Luer-lock cannula with an olive or thin catheter with anal speckle *in situ* often but not always visualises the internal opening. The fluid can be isotonic saline or hydrogen peroxide.

IMAGING

Background

The surgical dilemma is how to balance the risk of incontinence against the chance of cure of the fistula disease. By cutting through the fistula, the patient is cured of the infection, but closing the fistula – following possible seton – can often result in recurrence or persistence and the need for additional operative procedures [7]. The task of the surgeon is therefore to assess whether the fistula is simple and can be laid open without a greater risk of incontinence, or if the fistula is complex, possibly with secondary tracts and thus initially requiring a more conservative approach with placement of a draining seton prior to final surgery.

Identification of the internal opening and secondary tracts is not always possible in connection with the clinical examination pre- and perioperatively, and there is a higher risk of creating a false passage (*via falsa*) if the course of the fistula is not known. Lack of identification of the actual inner opening and neglected secondary tracts is the most common cause of fistula recurrence [8]. Preoperative imaging optimises the outcome [9,10,11].

Endoanal ultrasound scanning is a quick and inexpensive examination that can be repeated perioperatively as a dynamic investigation during ongoing exploratory probing. Use of hydrogen peroxide in the fistula as a contrast medium can help identify the course of the fistula tract [12]. In cases of acute abscess formation, perioperative scanning is a major advantage, especially in intersphincteric accumulations. Artefact formations, especially shadows occurring at the edge, may replicate non-existent fistula tracts, and it may be difficult to differentiate fibrosis from persistent open fistulae tracts [13,14].

An MRI scan is an expensive examination, but may reduce the number of repeat operations [15]. An MRI scan provides a better overview than endoluminal ultrasound scanning, which is an advantage with high, complex fistulae and secondary tracts. With regard to imaging technology, the sphincter complex should be viewed in the surgically relevant planes

and conducted with a fixed imaging protocol [16] and the classical St. Mark's fistula diagram is recommended. Optimal imaging is achieved through a combination of MRI and endoanal ultrasound scanning [17].

Recommendations

- The course of the fistula tract in relation to the sphincter is identified through clinical examination under general anaesthesia with exploratory probing and injection of liquid. (B), IIa.
- MRI scanning is particularly indicated in cases of suspected complex fistula, or if the patient has had a recurrence. Ideally, the MRI scan should be supplemented with an endoluminal ultrasound scan. The diagnostic imaging should result in a standardised description. (B), IIa.

SURGICAL TREATMENT FISTULOTOMY

Background

The method is used primarily for simple fistulae, laying the fistula tract open from the internal to the external opening and with subsequent secondary healing.

Procedure

Classically, the fistula tract is incised above the introduced probe or the seton suture. The fistula tract then undergoes curettage or excision. The limiting factors for use of the method is the amount of the external sphincter involved. With a division of > 30–50% of the sphincter or the presence of anterior fistulae in women, the risk of incontinence is far greater [18]. If there is any doubt about the amount of sphincter involvement, an imaging modality should be undertaken [19].

Results

A randomised study has shown a reduced time for healing (median 34 days) after the fistula is laid open and excised compared with being laid open only (41 days). The further need for surgical revision and the recurrence rate was not different between the two groups [20]. In a randomised study of 46 patients, the effect of marsupialisation was examined, and the result was less wounding reduced wound secretion and a reduced risk of postoperative bleeding [21,22].

In general, it is difficult to compare the studies, which are often retrospective. Fistula classification is most often based on clinical examination alone. Rates of recurrence vary from 0% to 21% and incontinence from 0% to 82% [23,24,25]. In a retrospective study of 84 patients, recurrences were found in 4.7% and flatus incontinence in 3.5% of patients following fistulotomy with marsupialisation in low fistulae [26]. In a retrospective study, it was found that the only factor that was decisive for postoperative incontinence was when more than 25% of the external sphincter was divided [27].

In a study that included 52 patients with high fistulae, 48 had undergone lay-open surgery. The healing rate was 96%, two

had a fistula recurrence, and there was the same risk of incontinence as in patients who had been operated on for a low fistula [28]. In 120 patients who underwent surgery for recurrent or complex fistula, a fistulectomy and advancement flap came out with poorer continence status [29]. However, it is not only the amount of sphincter involvement in the fistulotomy that is decisive – factors such as gender, anterior location and other associated conditions are important [30].

Recommendations

- Fistulotomy with the lay-open technique is the primary treatment for simple fistulae in continent patients with less than 30% of external sphincter involved as assessed by clinical examination or by an MRI scan. (B), IIa.
- Marsupialisation results in fewer wound problems and reduces the healing time. (B), Ib.

SETON

Background

Use of a seton in the treatment of anal fistulae is essential. Many different techniques and materials have been used over the years [31]. In principle, you can choose to treat with a loose or tight seton.

Procedure

Correct positioning must be ensured with the patient under general anaesthesia. After careful probing, the seton material is passed through the fistula tract. In this way, the external orifice is connected to the internal orifice, thus defining which part of the sphincter apparatus lies in the grip of the seton. By using a tight seton, the skin overlying the fistula is excised. In Denmark, polyfilament non-resorbable suture, monofilament nylon or silicone bands are traditionally used as seton.

Loose seton

A loose seton is used as follows:

- 1) Drainage and marking of the fistula tract.
- 2) Bridge to surgery.
- 3) Definitive treatment. The natural caudal migration of the seton material is utilised.
- 4) Chronic treatment. Providing a controlled, well-drained fistula in patients who do not want or are not suitable for further treatment, e.g. patients with Crohn's disease.

Results

It is controversial whether or not a seton is necessary as a preoperative preparation. In a randomised study, it was shown that preoperative seton treatment does not improve the outcome in cases of an endorectal advancement flap [32]. Small inhomogeneous case-based studies have described the outcomes following the use of loose seton as definitive treatment. The time from placement of the seton to the point where it has moved caudally to the sphincter apparatus varies from 2 to 14 months [33,34,35,36]. Recurrence after a minimum of 12 months varies from 0% to 20% [33,36]. The rate of early complications is indicated as being 12% (bleeding/abscesses) following use of a loose seton

[36]. Incontinence for flatus and loose stools is reported to be from 0% to 8% [33,34,35,36].

Tight (cutting) seton

The principle is to divide the external sphincter gradually under formation of fibrosis so that the ends of the divided muscle ends are fixed, thus avoiding major defects in the sphincter apparatus. It is considered to be essential:

- 1) to drain acute infection before starting to tighten the seton suture [37].
- 2) to regulate the intervals for tightening of the seton so that it does not compromise continence.

Results

There are several case-series describing the results following the use of a tight seton. Recurrence is reported as being between 0% and 9% [38,39,40]. The time interval between the tightening is reported to be between 1 and 2 weeks with the exception of one study [41]. Early complication rates are not disclosed in the literature, but experience shows that pain immediately following tightening is certainly a problem.

Incontinence rates are reported to be between 0% and 2% in the studies in which the seton is tightened with intervals of 1–2 weeks [38,39,40].

Recommendations

- A Loose seton can be used for drainage, marking the fistula tract, preoperative preparation, and for definitive as well as chronic treatment of anal fistulae. (B), III.
- A tight seton can be used for controlled cutting, thus eliminating anal fistulae. (B), III.

FIBRIN GLUE

Background

Fibrin glue consists of fibrinogen and thrombin. A mixture of the components forms a viscous material that is injected into the fistula tract. The method is sphincter preserving. This technique has been used for the past 20 years [42].

Procedure

The fistula is cleaned by curettage and rinsed thoroughly so that all granulation tissue and epithelial debris are removed. The internal orifice is closed with fibrin glue by simple suturing or with an endorectal advancement flap. The procedure is contraindicated if there is acute infection or retention.

Results

A Cochrane review [43], two randomised studies [44,45], two reviews [46,47] and a number of case-series have been published. In the two reviews, recurrence rates of 53% (range 10–78%) was reported in one study [46] and a variation in recurrence rate of 0–100% in the other [47]. In the randomised studies, fistulotomy and endorectal advancement had better results than fibrin glue [44,45]. Abscesses occurred in the early course, but the frequency is unknown. The incontinence rates are reported to be 0% [44,45,46,47].

Recommendations

- Fibrin glue cannot be recommended in its present form for the treatment of anal fistulae. (A), Ia.

ANAL FISTULA PLUG

Background

The anal fistula plug is produced in a biological and a synthetic version [48,49]. The indication is treatment of transsphincteric fistulae. The initial experiences with the biological plug are from 2006 [49]. Experiences with the synthetic plug are more recent [48].

Procedure

The biological plug consists of an acellular collagenous material. The product is extracted from the submucosa of the pig small intestine. The plug is inserted (biologically or synthetically) into the fistula and fixed at the internal opening in the anal canal. The principle of the treatment is an in-growth of fibroblasts into the plug, which is gradually replaced by native connective tissue. Remaining epithelial debris, granulation tissue in the fistula tract or unrecognised secondary tracts are considered to be responsible for the failure to heal. The individual steps and recommendations are published in a consensus report from 2008 [50].

Results

The initial reports on the biological plug were optimistic, with success rates of 80–85% [49]. A subsequent systematic review reported a varying success rate of 24–92% [51].

Two randomised studies compared the anal fistula plug to the endorectal advancement flap. Both studies argue in favour of the endorectal advancement flap [52,53].

In one study it was found that the healing rate after 8 weeks was 84%, but after 12 months it was reduced to 54% [54]. In 25% of the patients with clinical healing, MRI scanning detected signs of residual fistula tract [55]. The success rate of the synthetic plug has been reported to be 0% to 75% [56,57].

Abscess rates are indicated to be between 4% and 29% and early expelling of the plug varies between 4% and 41% [51]. Incontinence rates are reported to be 0%.

Recommendations

- An anal fistula plug can be used in the treatment of transsphincteric anal fistulae, but the results vary widely. (B), IIa.

FISTULECTOMY AND PRIMARY SPHINCTER RECONSTRUCTION

Background

The rationale behind fistulectomy and primary sphincter reconstruction is to eliminate the infection and to reconstruct the defect in the external anal sphincter. Patients with recurrent fistula, existing sphincter defect and preoperative incontinence are particularly suitable for the procedure.

Procedure

In order to eliminate the acute infection and to achieve a well-organised fistula tract, a loose seton is recommended for 2–3 months prior to surgery. The fistula tract is probed and cleaved. A complete fistulectomy of the entire fistula tract is performed, including excision of the internal orifice. Any cavities and extensions of the fistula tract are removed using curettage. The external sphincter is reconstructed end-to-end with resorbable suture knots (perimysium suture). The most peripheral part of the incision is left open for drainage. Anal mucosa/modified skin and the internal sphincter are sutured with continuous sutures.

Results

There is only one published randomised study [58], which included 60 patients with high transsphincteric (80%) or suprasphincteric (20%) fistulae. The patients were randomised to either advancement flap or fistulectomy and primary sphincter reconstruction. Follow-up was 36 months. Five patients were excluded at the time of the operation due to an active infection. Two patients in each group had a recurrence (7.4% and 7.1% respectively). There was no difference in continence status pre- and postoperatively between groups and no difference in manometric measurements. The conclusion was that both techniques are equally effective and safe.

A retrospective study with a total of 146 patients assessed a combination of fistulectomy and advancement flap (A) and fistulectomy and primary sphincter reconstruction (B). The recurrence rate was 18.3% in group A versus 10.6% in group B. Follow-up was 13 months. In the advancement flap group, 43.6% were incontinent, while this was only the case for 21.3% of the group that underwent sphincter reconstruction [59].

A prospective study included 70 patients with complex perianal fistulae [60]. The recurrence rate was 8.6% after a follow-up period of 81 months. Following fistulectomy and sphincter reconstruction, 70% of patients with preoperative incontinence had improved continence status, while 16.6% of patients who preoperatively were continent became incontinent to a mild degree postoperatively.

In three publications [61,62,63] on cohorts of 14 to 35 patients with high transsphincteric fistulae, the recurrence rate varied between 5.7% and 14%. Postoperative incontinence to a lesser extent occurred in 0% to 21%. This was most pronounced in the study that included patients with earlier recurrence of fistula [61].

Recommendations

- Fistulectomy with primary sphincter reconstruction can be used to treat complex anal fistula. The technique is particularly suitable for treating incontinent patients with a defect in the external sphincter. (B), III.

LIFT (Ligation of the Intersphincteric Fistula Tract)

Background

The rationale behind this technique is that both the internal and the external sphincter are kept intact, the infected tissue in the intersphincteric space is excised and the internal fistula orifice is closed.

Procedure

It is important to eliminate acute infection and to achieve a well-organised fistula tract. Therefore, a loose seton for 2–3 months is recommended prior to surgery. An incision above the intersphincteric groove is performed followed by a dissection in the intersphincteric space until the fistula tract is identified. The tract is exposed, ligated and divided close to the internal and the external sphincter. The external opening is excised and this area is left open. The intersphincteric skin incision is approximated with resorbable sutures [64]. A Biomesh (BioLIFT®) may be inserted into the intersphincteric space in order to separate the two ends of the fistula tract [65].

Results

There are a total of 15 published articles on the LIFT procedure. Rojanasakul et al. published a prospective study of 18 patients and found a healing rate of 94% at the 3-month follow-up [66]. Most studies are retrospective, descriptive series with relatively few patients with cryptoglandular, transsphincteric fistulae. Follow-up is variable and mainly short. The healing rates vary from 57% to 94% [66,67,68,69,70,71,72,73,74]. In all the studies, the success rate was assessed by clinical examination. There are no studies using MRI at postoperative evaluation. Complication rates following the LIFT procedure are low, and generally there are no reports of compromised continence.

There is a single randomised study in which 25 patients were treated with LIFT and 14 with an advancement flap. Recurrence rates at 19-month follow-up were 8% and 7%, respectively. In the LIFT procedure, the operating time was shorter, patients reported better quality of life, less pain and earlier return to normal daily activities [75]. Han et al. combined the LIFT technique with the anal fistula plug (LIFT-Plug) in a prospective study and achieved a healing rate of 95% with a follow-up of 14 months [76].

The advancement flap has been combined with LIFT in 41 patients, but there was no evidence that this combination could increase the healing rate [77]. Similarly, insertion of biomesh (Surgisis) intersphincterically following division of the fistula tract has been used in 31 patients. Follow-up was 15 months and a healing rate of 94% was achieved. This study included patients with inflammatory bowel disease, diabetes, and previous unsuccessful fistula surgery [65].

Generally, it has been found in several of the studies that non-healing fistulae following the LIFT procedure are converted to intersphincteric fistulae, which can then be treated by fistulotomy without deterioration of continence [73, 74, 77].

Recommendations

- LIFT may be used for transsphincteric fistulae. (B), III.

ADVANCEMENT FLAP

Background

Use of advancement "full-thickness" musculomucosal flap as a surgical method in complex anal fistula was first described in 1912 by Elting [78]. In principle, the technique is based on preventing passage of intestinal contents from the intestinal lumen to the fistula tract.

Procedure

The procedure is performed by raising a 4 cm long and 3 cm wide semicircular/elliptical "flap" around the internal fistula orifice consisting of mucosa, submucosa and muscular fibres. Varying degrees of muscle fibre content in the flap have been described, ranging from a few muscle fibres to containing the full-wall internal sphincter and rectal circular muscle fibres. The internal muscular fistula orifice is closed with resorbable sutures. After excision of the "flap" apex, containing the fistula defect, it is advanced in the direction of the anus and sutured to the anal incision line with resorbable sutures. The external fistula orifice is left open following previous curettage or excision [79,80,81,82,83].

Results

A systematic review comprising 35 publications in the period from 1978 to 2008 has been published [84] and which includes 1335 operations of fistulas with a cryptoglandular background. With an average follow-up time of 29 months, success rates varying from 24% to 100% with a weighted average of 81% were reported. The incidence of postoperative anal incontinence was indicated with frequencies ranging from 0% to 35%, with a weighted average frequency of 13% [84].

There are four randomised trials in which advancement flap surgery is rated against other surgical methods. Three of these publications are incorporated into the above review. The most recently published article compares the use of anal fistula plug with endorectal advancement flap. In the latter group, after 1 year of observation, recurrence has been found in 2 out of 16 (12.5%) patients treated. There was no indication of incontinence frequencies in the article [85].

Recommendation

- The advancement flap method can be used in the treatment of complex anal fistula. (A), Ib.

VIDEO-ASSISTED ANAL FISTULA TREATMENT (VAAFT)

Background

VAAFT is a new method developed for the treatment of complex anal fistula.

Procedure

The procedure is performed with a rigid video-linked fistuloscope with an optical and a working channel. The procedure has a diagnostic and a therapeutic phase. The purpose of the diagnostic phase is to identify the internal fistula orifice and possible secondary tracts. In the therapeutic phase, the fistula

tissue is destroyed by electrocoagulation. The internal fistula orifice is lifted with marking sutures and closed with a semi-circular or linear stapler. Cyanocrylate (0.5 ml) is applied just below the staple line through a thin catheter introduced into the external orifice [86].

Results

There is one publication on VAAFT, involving 136 non-consecutive patients. Ninety-eight patients are included in the analysis with a median follow-up period of 13 months. The success rate after 3 months was 73.5% for all the patients and 87.1% for 62 patients followed for at least 12 months. None of the patients experienced an effect on continence [86].

Recommendation

- VAAFT may be used for the treatment of complex anal fistula. (C), III.

OTSC[®] CLIPS

Background

The technique is a sphincter preserving, minimally invasive procedure for closing the inner fistula opening. The method has been used for the treatment of gastrointestinal bleeding, perforations and intestinal fistulae [87].

Procedure

A preoperative draining seton is recommended. The anoderm is excised circumferentially around the internal opening so that the internal sphincter is exposed with a radius of 1 cm. If the internal opening of the fistula is localised in the rectum, it is not necessary to circumcise the mucosa. The fistula is cleaned with a fistula brush. Two absorbable sutures are inserted into the sphincter (or muscularis if in the rectum) around the internal opening crosswise. The sutures are passed through a clip applicator and the clip is released, thus closing the internal opening [88]. The method has primarily been evaluated in pigs.

Results

There is currently only one case report on closure of anal fistulae [89].

SPECIAL CIRCUMSTANCES ANOVAGINAL FISTULAE

Background

The symptoms are pain, purulent or faecal secretions and air discharge from the vagina. The cause is often a grade 3 or 4 sphincter tear during childbirth. The fistula may manifest immediately but more frequently within 1–2 weeks after delivery. The incidence is 0.06–0.1% of all vaginal births [90, 91]. The cause may also be cryptoglandular infection, Crohn's disease, iatrogenic injury, radiation and anorectal or vulvar cancer.

In the literature, the quality of the data varies, and anovaginal fistula of cryptoglandular or obstetric aetiology is often mixed with data for complex anovaginal fistula including patients with Crohn's disease.

Procedure

A simple anovaginal fistula is without secondary tracts and is surrounded by healthy tissue. Closure of the fistula can be attempted after maturation with an inserted seton suture with the same surgical procedures as for perianal, cryptoglandular fistulae (advancement flap, anal fistula plug, collagen mesh, LIFT procedure). A complex anovaginal fistula is wider, lies higher in the rectovaginal septum, has anal sphincter defects, is present in Crohn's disease, and is a result of radiation therapy or cancer, or recurrence after previous fistula surgery.

The methods for fistula closure will often be combined with the interposition of healthy tissue (anal sphincteroplasty, gracilis interposition or Martius flap with or without a diverting stoma).

Results

Advancement flap

Simple anovaginal fistulae treated with advancement flap is successful in 65–91% of patients [92,93,94]. One study compares advancement flap with transperineal repair and levator interposition. A total of 88 patients with heterogeneous aetiology were included in the study and the procedural choice depended on the type of fistula. The rate of healing was 78% in the group with an advancement flap [95].

Anal fistula plug or collagen mesh

A preliminary series carried out on 34 patients (with follow-up after 6 months (range 3–12 months) showed a success rate of 81% (22/27 with collagen mesh, 6/7 with anal fistula plug) [93]. Two centres have published their collective experience of the method on a total of 21 patients with rectovaginal/anovaginal fistula with mixed aetiology [96]. The overall success rate after a mean follow-up of 12 months (range 3–18 months.) was 71%.

LIFT procedure

No published data.

Fistulectomy and anal sphincteroplasty

Combined intervention with sphincteroplasty and advancement flap in a series of 20 patients with exclusively obstetric-related anovaginal fistulae showed a success rate of 95% [97].

Without the use of mesh and only excision of the fistula tract, overlapping sphincteroplasty with layered closure, 6/7 patients were healed with a median 24 months of follow-up [98]. Transperineal access with levator interposition has shown a healing success rate of 65% in a series of 34 patients [95].

Gracilis flap

In 12 patients with Crohn's disease-associated anovaginal fistula, success rates of up to 92% with an average of 3.4 years of follow-up have been reported [99].

Martius flap

This method mobilises a primary adipose tissue pedicle from the labia, which is inserted after excision of the fistula tract. In a series of a total of 20 patients collected over 10

years (median follow-up: 35 months), the procedure was 65% successful. If the fistula was not associated with Crohn's disease, the success rate was 75% [100]. In two other series with 14 and 16 patients respectively, the overall success rate was 86–95% [101,102].

Recommendations

- Anovaginal fistula can be treated by much the same methods as anal fistula. (B), III.
- In the case of complex fistula, methods may often be advantageously combined with or without a diverting stoma. (B), III.

CHILDREN (<18 years)

The results in the literature are inconclusive. The majority of fistulae on a septic basis are simple fistulae and only in 6% was there significant involvement of the anal sphincter [103]. In complex or more atypical fistulae, there may be signs of congenital malformations, for which the child should be examined. Fistulotomy with the lay-open technique is the most common intervention, with a reported recurrence rate of 13% in a series of 92 children [104]. Information on possible complications in the form of continence problems is very poor and almost non-existent. With surgical drainage of perianal abscess, an accompanying fistula was detected in 73%, while a fistulotomy reduces the risk of recurrence [105]. Other studies have shown that adjuvant antibiotic treatment reduces the risk of fistula recurrence [106].

Recommendations

- The vast majority of fistulae are simple and can be treated with a fistulotomy, also in cases where there is perianal sepsis. (B), IIa
- In cases of complex fistula, congenital malformation must be ruled out. (C), III

THE IMMUNOSUPPRESSED PATIENT

There are no certain indications of frequency or treatment of perianal fistulae in patients who are immunosuppressed (HIV, haematological patients and organ transplant patients).

Recommendations

- Treatment is a highly specialised function. (C), III.

STEM CELL THERAPY

Background

The theoretical background for the use of fat-derived stem cells is that stem cells work partly as immunosuppressive factors and can partly differentiate connective tissue cells.

Procedure

Among the small number of studies described, stem cells are used either alone or in combination with fibrin glue [107,108,109,110]. The technique is to close the internal opening and then apply between 20 and 60 million fat-derived stem cells alone or in combination with fibrin glue.

Results

Treatments with stem cells have not demonstrated a greater success rate than with fibrin glue alone.

SUMMARY

The course of the fistula tract in relation to the anal sphincter is identified by clinical examination under general anaesthesia using a fistula probe and injection of fluid into the external fistula opening. In the event of a complex fistula or in the case of fistula recurrence, this should be supplemented with an endoluminal ultrasound scan and/or an MRI scan. St. Mark's fistula chart should be used for the description. Simple fistulas are amenable to fistulotomy, whereas treatment of complex fistulas requires special expertise and management of all available treatment modalities to tailor the right operation to the individual patient. The given levels of evidence and grades of recommendations are according to the Oxford Centre for Evidence-based Medicine (www.cemb.net).

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