

# Proctological Interventions

*Rüdiger Probst*

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Proctology has an interdisciplinary character with surgical, dermatological, and venereal disease conditions. In the true sense of the word, it is a marginal field for endoscopy; normal coloscopic techniques are not helpful. Nevertheless, most anorectal diseases that will be presented in this chapter may well be diagnosed and also treated by means of meticulous inspection, rectal digital examination, and proctoscopy.

## 9.1 Hemorrhoids (AWMF Hämorrhoidalleiden; Riss et al. 2012)

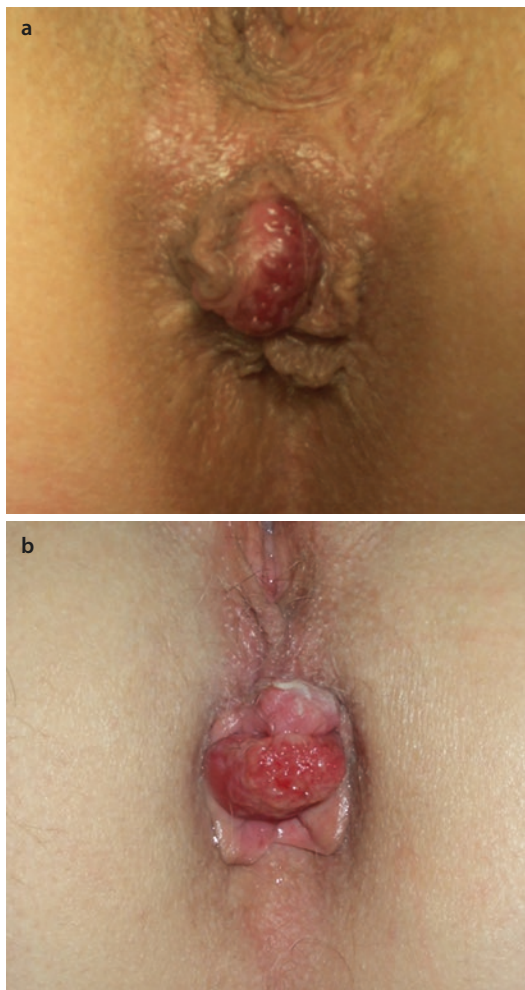
### ■ General Aspects: Anatomy and Physiology

Anatomically, hemorrhoids are an arteriovenous vascular conglomerate, called corpus cavernosum recti. They are located cephalad to the anal canal. Their vascular supply originates from the end arteries of the A. rectalis superior which runs along the tunica submucosa. The venous drainage is accomplished via small veins which penetrate the internal anal sphincter muscle and form larger venous collecting vessels within the intersphincteric region.

Hemorrhoids are physiological cavernous bodies which are responsible for achieving the so-called fine continence: during the continent phase, the corpus cavernosum recti have a firm elastic consistency, since the drainage of the blood is inhibited by the contracted internal sphincter. During defecation, the venous efflux is facilitated by a relaxation of the sphincter muscle, thereby reversing continence. Following defecation, this reflexive relaxation of the internal sphincter is discontinued, the hemorrhoidal cushions are filled with blood again, and the tight hemorrhoidal occlusion is restored.

### ■ Pathogenesis, Classification, and Symptoms

The hemorrhoids are kept in place in the upper anal canal by a scaffold of muscular and fibroelastic bands. Once this suspensory apparatus is destroyed, a permanent and irreversible distal dislocation of the hemorrhoids ensues. An additional hyperplasia of the hemorrhoids results in a pathological anatomy and function of the anal canal. The causes of these changes of a physiological hemorrhoidal apparatus into a pathological one are, for example, unphysiological defecation conditions through pressure of the bowel contents against the still-filled hemorrhoidal cushions, mimicking chronic obstipation or forced defecation.



■ Fig. 9.1 a, b Segmental, third grade hemorrhoidal prolapse (digital reposition possible)

The staging of pathologically enlarged hemorrhoids follows the size and extent of distal dislocation, the so-called prolapse:

- First-stage hemorrhoids are filled yet elastic convolutes within the anal canal which do not prolapse through the canal even following provocation.
- Second-stage hemorrhoids prolapse during defecation to the exterior of the anal canal. Following defecation, however, they are automatically retracted into the canal.
- Third-stage hemorrhoids (■ Fig. 9.1) also prolapse through the anal canal during defecation. However, following defecation, they are not automatically retracted into the canal, requiring manual repositioning by the patient.

- Fourth-stage hemorrhoids are permanently dislocated through the anal canal; they are fixed in this position and scarred. This may coincide with an eversion of the distal anal canal (prolapse of anoderm or anal prolapse). Manual repositioning as in third-degree hemorrhoids is no longer possible.

The staging of hemorrhoids is carried out by thorough history taking and a meticulous proctological examination. In this case, proctoscopy is not a static diagnostic measure but a functional investigation.

#### Tip

Even if it might be unpleasant for the patient, only by pressing can the extent of prolapse and thus the correct staging be determined.

- ! **First-stage hemorrhoids are diagnosed exclusively by proctoscopy. Inspection or digital exploration alone is of no diagnostic value. Even colonoscopy in inversion may not detect the correct stage, since the degree of prolapse remains obscured.**

Based on permanent anatomical changes within the anal canal due to the enlarged and prolapsing hemorrhoidal vascular convolutes, a complex of symptoms ensues which is predominantly a consequence of a disturbed fine continence, the clinical hemorrhoidal complex. It is noteworthy that the symptoms caused by hemorrhoids may be very variable and may also be independent of the morphology of the hyperplastic hemorrhoids. A frequent symptom is hematochezia, which is a consequence of mechanical stress to the prolapsed mucosa during defecation. The visible, bright-red blood does not originate from the arteriovenous plexuses but from congested arterial mucosal vessels which run near the surface of the hemorrhoidal convolutes. The disturbance of fine continence produces wetting and stool soiling.

#### Tip

Soiling, once noticed, is often erroneously interpreted as sphincteric insufficiency.

As a result of temporary or permanent mucosal prolapse, a moist perianal milieu is produced,



■ **Fig. 9.2** Acutely thrombosed hemorrhoidal prolapse

causing irritative-toxic anal eczema with pruritus. In addition, the prolapse causes a blunt pressing sensation similar to the impression of a foreign body in the anal area.

- ! **Pains which are precisely localized are not characteristic for hyperplastic hemorrhoids. Exceptionally, they may be associated with a thrombosed hemorrhoidal convolute (■ Fig. 9.2).**

#### ■ Treatment

Hemorrhoidal disease is one of the most frequent proctological diseases and is often referred to as a civilization disease. It has been estimated that up to 40% of the population of an industrial nation suffer from enlarged hemorrhoidal plexuses. At least every sixth person is affected by symptoms and sequelae of hemorrhoidal disease.

The primary aim of treatment is a long-lasting or permanent resolution of hemorrhoidal symptoms by restoration of the original anatomical and physiological conditions, usually achieved by creating hemorrhoids of normal size.

#### Tip

The need for treatment of enlarged hemorrhoids is tightly linked to symptoms and the degree of suffering of the patient. In the case of asymptomatic enlarged hemorrhoids, treatment is not mandatory!

The treatment of hemorrhoidal disease is determined by the stage classification described before. Independently, some additional basic treatment is recommended. Its rationale is the regulation of bowel movements by fiber-rich diet, increase of stool volume, and teaching of physiological defecation. Furthermore, anal hygienic measures are of importance such as cleansing with normal tap water, avoidance of moist cleansing towels, and possibly the regular administration of skin-caring substances, for example, soft zinc paste.

**!** The application of ointments/pastes and suppositories is no causative treatment, which means it has no influence on the hyperplastic hemorrhoidal convolutes. Topical substances may only influence and significantly reduce hemorrhoidal symptoms. A «*restitutio ad integrum*» may only be achieved by active medical intervention.

#### Tip

Hyperplastic hemorrhoidal convolutes are often misinterpreted as varices. There is, however, no plausible rationale for treatment with drugs that enhance the venous tonus, such as flavonoids which are useful for treating real varices.

The term «conservative hemorrhoidal therapies» comprises nonoperative procedures such as sclerosing therapy, rubber band ligation, and infrared therapy.

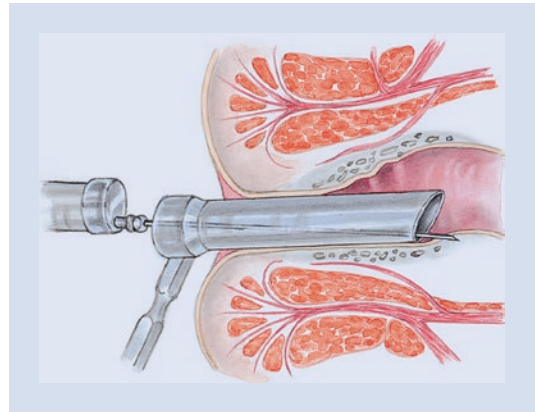
#### ■ ■ Conservative Treatment: Sclerosing Therapy

The sclerosing of hemorrhoids can be accomplished according to two different techniques, the method according to Blond and that according to Blanchard.

**Indication** Sclerosing therapy is the method of choice in first-stage hemorrhoids.

**Personnel Requirements** All conservative treatments may be, in principle, carried out by the treating doctor alone. For litigation reasons, however, it is advisable to have assisting personnel present.

**Instrumental Requirements** Generally, all proctological interventions may be carried out in lithotomy position, in side position, and in knee–elbow posi-



■ Fig. 9.3 Sclerosing therapy (From Lange et al. 2012)

tion. Most comfort to the patient is offered by a special examination and treatment chair which allows direct visual contact between the patient in lithotomy position and the treating doctor. Commercially available proctoscopes are the ones according to Morgan with an open front end and according to Blond with a lateral window. For the sclerosing procedure, a suitable sterile solution such as polidocanol is drawn into a 1-ml single-use syringe with a cannula (e.g., 20G/0.9 mm, 70 mm length). A suction device for removal of stool residues and an infrared coagulator (see below) for hemostasis may be helpful.

**Practical Execution** With the Blond method, the sclerosing agent is submucosally directly injected into the hemorrhoidal tissue in a circular fashion. On the other hand, with the Blanchard method, the agent is injected next to the vessels in 3, 7, and 11 o'clock lithotomy position to reduce arterial inflow (■ Fig. 9.3). Treatment sessions should be repeated 3–5 times over several weeks.

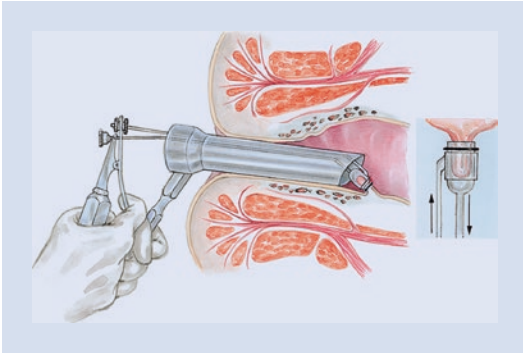
#### Tip

Left out, because of no use for the English-speaking market!

#### ■ ■ Conservative Treatment: Rubber Band Ligation

**Indication** Rubber band ligation is the therapy of choice in the treatment of second-stage hemorrhoids.

**Personnel Requirements** As for sclerosing treatment



■ **Fig. 9.4** Rubber band ligation (Barron procedure; from Lange et al. 2012)

**Instrumental Requirements** As in sclerosing treatment. Rubber band ligation requires a proctoscope with frontal opening and an applicator system for the rubber ring, either a rubber band suction applicator or a mechanical ligation instrument (e.g., according to Rudd or McGivney/Schütz) with a hemorrhoidal grasping clamp.

**Practical Execution** During rubber band ligation according to Barron (■ Fig. 9.4), by means of a special applicator, a rubber ring is placed around the base of a hemorrhoidal convolute through the proctoscope. In order to avoid a slippage of the rubber ring, an additional injection of a sclerosing agent into the occluded hemorrhoidal node may be done. The occlusion of the hemorrhoidal tissue results in a necrosis within a few days, with the result of a sequestration of the necrotic tissue during the following 1–3 weeks.

When applying the rubber band, it is of utmost importance to position it well above the dentate line in a pain-free area. If the patient expresses pain during or directly following application of the rubber band (ask!), the rubber band should be removed (use of fistula hook is helpful!) and placed a new some distance more orally from the previous position.

! **Clinically relevant hemorrhages due to sequestration of the necrotic tissue within 1–3 weeks are observed in less than 1% of cases. They may, however, become relevant in cases of anemia and then require an intervention, usually by stitch ligation of the bleeding spot.**

Therefore, it is mandatory to inform the patient about the possibility of this rare complication and to supply emergency phone numbers and emergency addresses.

#### Tip

In patients with allergy to latex, special latex-free rubber bands should be used for the ligation.

For economic reasons, a simultaneous ligation of all enlarged hemorrhoidal convolutes might be desirable. However, this might be followed by an increase of potential complications such as bleeding, vasovagal syncope and disturbances of micturition and defecation.

#### ■ ■ Conservative Treatment: Infrared Therapy

**Indication** Infrared therapy is suitable for achieving hemostasis in first- and second-stage hemorrhoids.

**Personnel Requirements** As in sclerosing therapy

**Instrumental Requirements** As for sclerotherapy. Infrared therapy requires a proctoscope with frontal opening and an infrared coagulator (■ Fig. 9.5).

**Practical Execution** In infrared therapy, a pistol-shaped infrared coagulator with exchangeable protective cap is introduced via the proctoscope with a frontal opening. By direct contact of the coagulator tip with the bleeding site, by means of heat application, localized tissue necrosis with hemostatic properties is induced.

#### Tip

Infrared coagulation is also suitable for stopping bleedings arising from a stitch canal injury following sclerosing therapy.

#### ■ ■ Semi-operative Treatment: Doppler-Guided Hemorrhoidal Artery Ligation (HAL) with/without Recto-anal Repair (RAR)

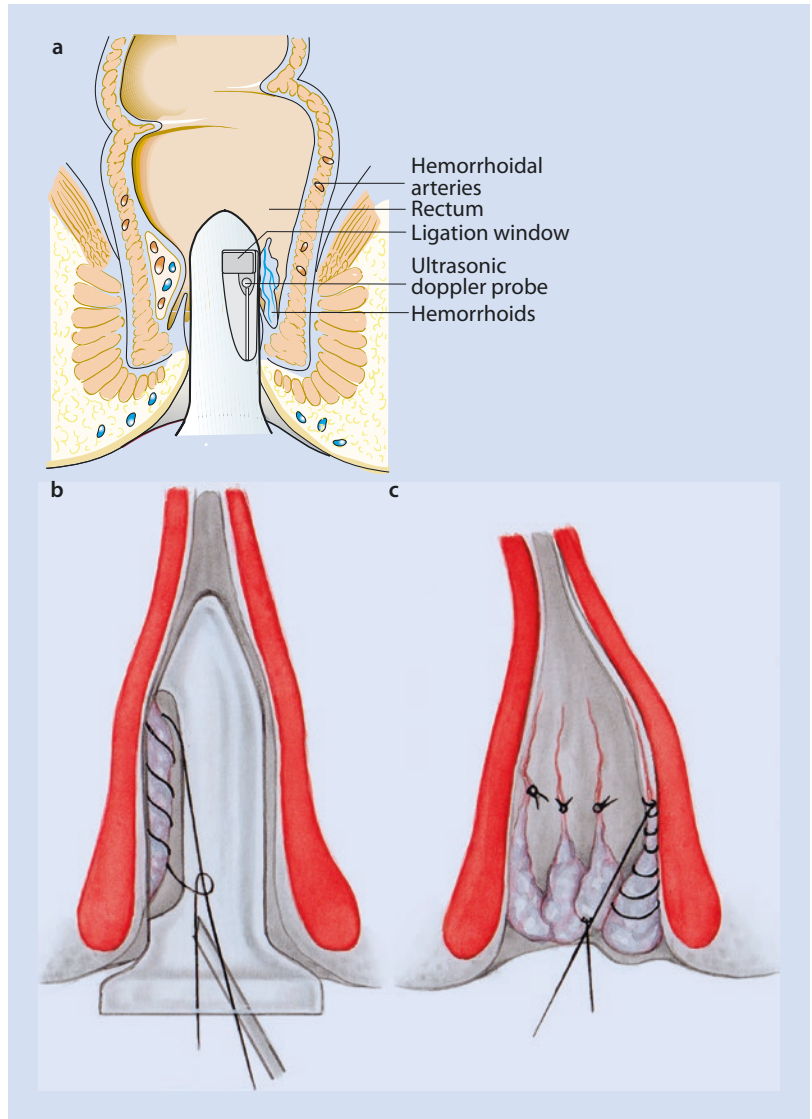
In HAL (■ Fig. 9.6), second- and third-stage enlarged hemorrhoidal convolutes are treated in a semi-operative fashion, usually requiring brief anesthesia or analgo-sedation. Using a specifically designed proctoscope with a Doppler ultrasonic probe, the hemorrhoidal artery is localized and stitch ligated under sonographical control. Recently it has been advocated that HAL should





■ Fig. 9.5 a, b Infrared coagulator (b with permission from Lumatec)

■ Fig. 9.6 a–c Doppler-guided ligation of hemorrhoidal artery (HAL) (b and c from Lange et al. 2012). In the text: hemorrhoidal arteries, rectum, ligation window, ultrasound Doppler sensor, hemorrhoids



be combined with a recto-anal repair (RAR) where concomitantly the prolapsing hemorrhoidal convolutes are tied up.

The actual evidence concerning HAL with or without RAR is not solid enough yet as to recommend the strategy for a routine situation. HAL–RAR is to be looked at as an intermediate procedure between nonoperative and operative–resectional treatments, to be used, for example, as an option following unsuccessful rubber band ligation in second-stage hemorrhoids.

### ■ Operative Treatment

When third-stage hemorrhoids are diagnosed which do not retract spontaneously after defecation and therefore have to be repositioned manually, operative treatment is indicated.

The operative treatment is not an endoscopic procedure, but it appears to be essential to give an overview of the actual procedures, since endoscopic procedures might become necessary after the operation and knowledge about the differential indications in relation to conservative procedures is most relevant. For more details, textbooks for surgery should be consulted.

There are two different approaches for the operative procedures: anoderm-resecting and anoderm-preserving techniques.

#### Popular Operative Procedures

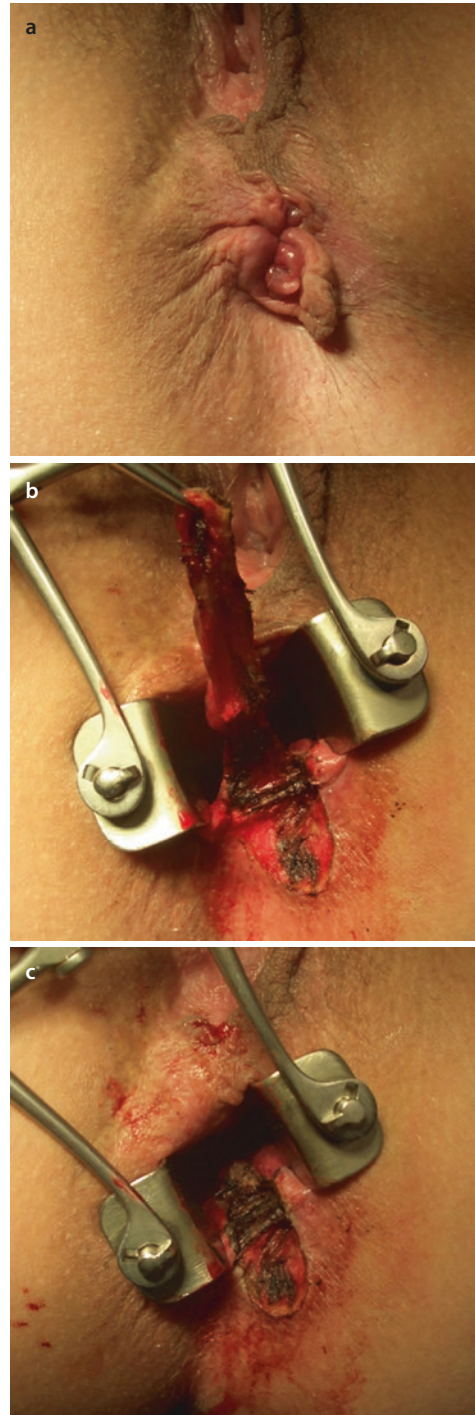
##### Anoderm-resecting procedures:

- Open hemorrhoidectomy according to Milligan–Morgan
- Closed hemorrhoidectomy according to Ferguson

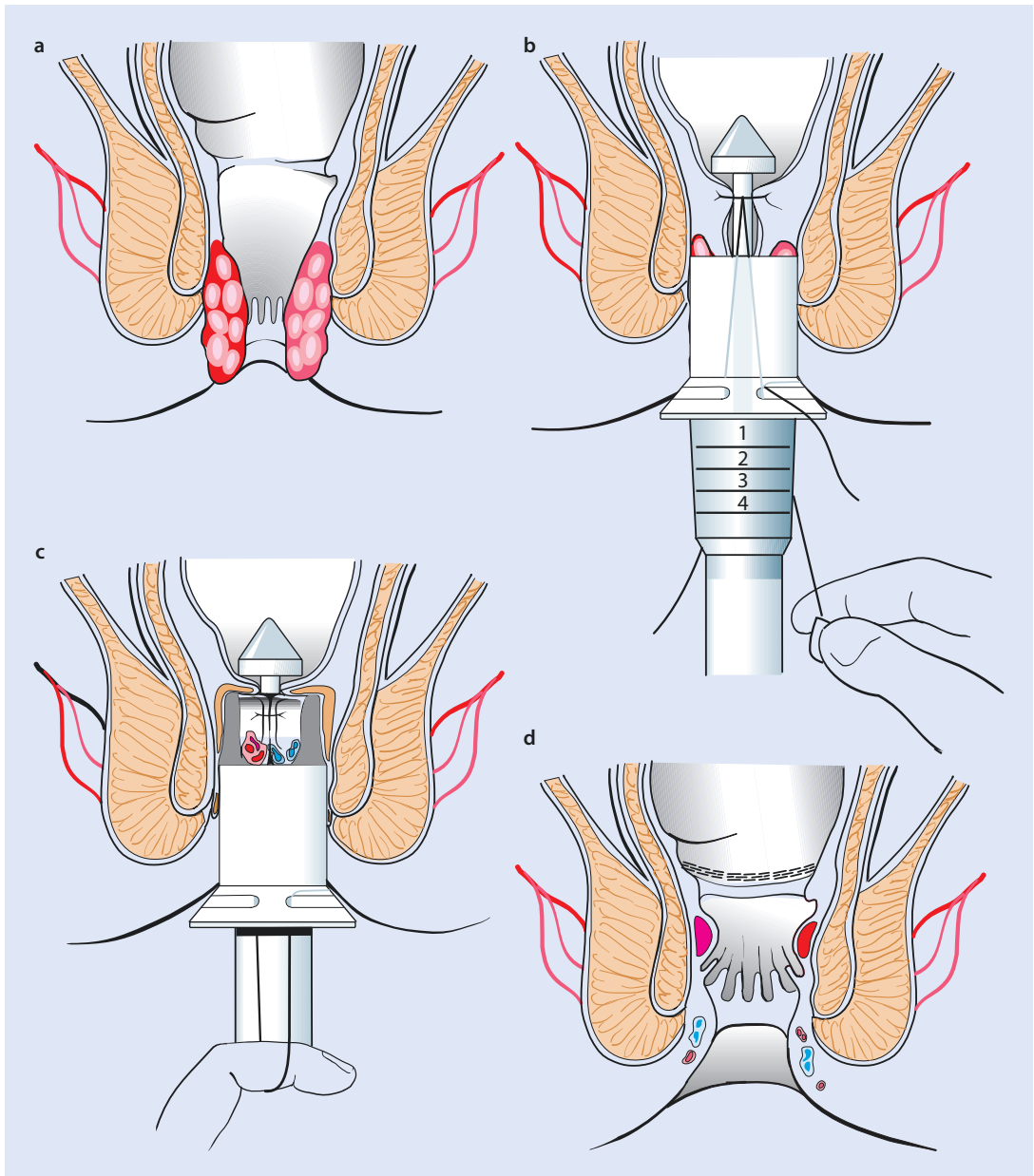
##### Anoderm-preserving procedures:

- Submucous hemorrhoidectomy according to Parks
- Reconstructive hemorrhoidectomy according to Fansler–Arnold
- Supraanodermal hemorrhoidopexy (stapler) according to Longo

In the frequently applied open hemorrhoidectomy according to Milligan–Morgan (■ Fig. 9.7), the enlarged hemorrhoidal convolutes are excised together with the adjacent anoderm, leaving the closure of the defect to secondary wound healing.



■ Fig. 9.7 Segmental hemorrhoidectomy (Milligan–Morgan operation). a Preoperative finding with segmental anal hemorrhoidal prolapse and mariscas at 5 o'clock lithotomy position. b Segmental resection of hypertrophic hemorrhoidal tissue preserving the adjacent M. sphincter ani internus. c Postoperative result



■ Fig. 9.8 Stapler hemorrhoidopexy (Longo operation)

The also frequently applied stapler hemorrhoidopexy according to Longo (■ Figs. 9.8, 9.9, and 9.10) combines the resection of the prolapsing hemorrhoidal convolutes with a lifting of the prolapsed hemorrhoids, avoiding injury to the pain-sensitive anoderm. The stapler procedure is therefore well suited for third-stage circular hemorrhoids which can be repositioned. This procedure is not indicated for fourth-stage fixed anal prolapse, however!

## 9.2 Anal Fistula (AWMF) Kryptoglanduläre Analfisteln; Heitland 2012)

### ■ General Aspects: Pathogenesis and Symptoms

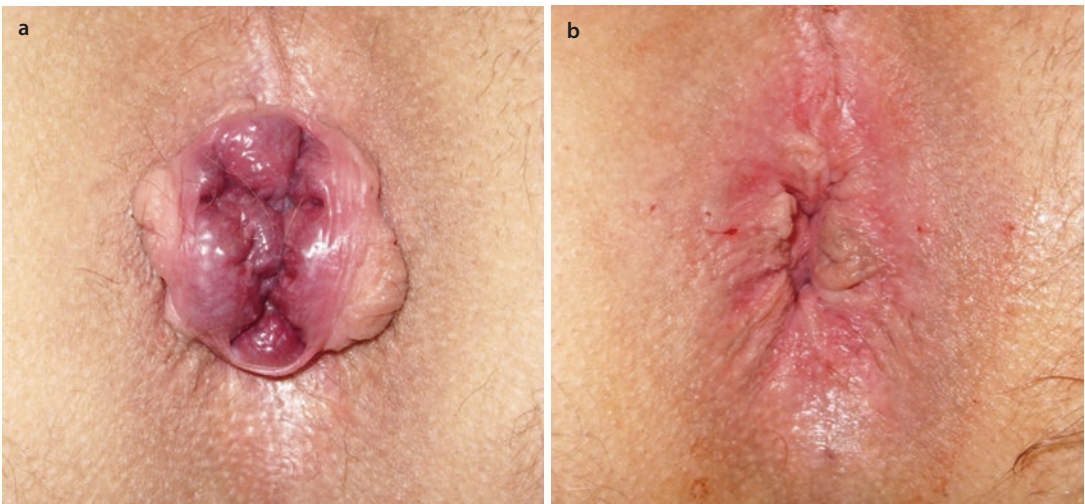
Anal fistulae (■ Fig. 9.11) usually originate from the anal cryptae in the area of the dentate line. Starting with a so-called «cryptoglandular» infec-



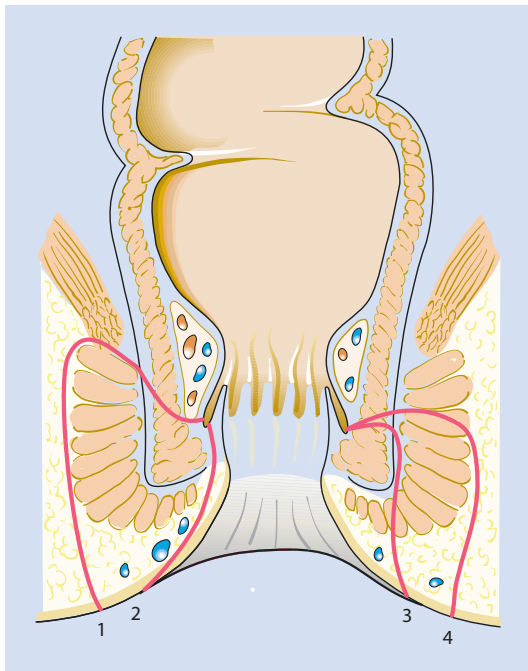


**Fig. 9.9** Stapler hemorrhoidopexy (Longo operation). a Preoperative finding with circular anal hemorrhoidal prolapse. b Insertion of the opened stapler. c Before clo-

sure of the stapler and after tying the purse-string suture. d Postoperative result



**Fig. 9.10** Stapler hemorrhoidopexy (Longo operation). a Preoperative finding with circular prolapse. b Postoperative result



■ Fig. 9.11 Classification of anal fistulae: 1 suprasphincteric, 2 subanodermally, 3 intersphincteric, 4 transsphincteric

tion of the regional proctodeal glands, a primary abscess is established which normally shows an unapparent clinical course, resulting either in a spontaneous healing or a drainage into the anal canal. If, however, a propagation of the inflammation along regional structures and along the lowest resistance into different spaces is the consequence (submucosal, subanodermal, intersphincteric, transsphincteric, suprasphincteric), a secondary abscess ensues, causing the clinically apparent anal abscess. When this abscess spontaneously finds its way to the skin or neighboring structures, a fistula is constituted. Therefore, anal abscess and anal fistula, as far as etiology is concerned, are the same disease entity: the anal abscess is the acute and the anal fistula the chronic manifestation of the same underlying disorder.

Anal fistulae caused by Crohn's disease, trauma, or iatrogenic manipulation therefore very often have an atypical course and do not necessarily spread along the local anatomical structures.

While anal abscesses are acutely evident by intense pain with systemic signs of infection, the symptoms of perianal fistulae are determined by the changing inflammatory pattern of this chronic disease. Frequently, fistulae exhibit a varying mostly purulent secretion from perianal external openings (■ Fig. 9.12). As a consequence, anal hygienic problems with pruritus and anal eczema might follow.



■ Fig. 9.12 External fistula opening at 6 o'clock lithotomy position about 3 cm away from the anocutaneous line

! The external anal fistula ostium may temporarily be occluded by epithelial ingrowth. This should not be mistaken for a true spontaneous healing of the fistula: unfortunately, this will not occur!

#### ■ Classification

- Anal fistulae are classified according to their relation to the sphincter:
- Submucosal/subanodermal/subcutaneous fistulae are located underneath the rectal mucosa, the anoderm, or the skin, respectively.
- Intersphincteric fistulae are located between internal and external sphincter.
- Transsphincteric fistulae penetrate both the internal and external sphincter; a further classification differentiates among high, intermediate, and low or distal position.
- Suprasphincteric fistulae usually ascend into the intersphincteric area, surround the external sphincter, penetrate the puborectal sling, and reach the perianal region via the fossa ischiorectalis.

The abovementioned anal fistula types are also called cryptoglandular fistulae because their internal fistula opening is located within the dentate line in the excretory channel of a proctodeal gland and appears to originate from a crypt. Roughly 85–95% of all anal fistulae run inter- and transsphincterically. A separate evaluation concerns the extrasphincteric fistulae, which may not be described by the abovementioned scheme. Here, the internal fistula

ostium is not located in the area of the dentate line but rather, for example, in the lower rectum. The fistula channel then penetrates the anal levator before reaching the perianal region.

Without adequate treatment, i.e., surgical intervention, an extension of the fistular disease with abscess formation and impaired sphincter function has to be expected.

### ■ Treatment

The treatment of anal fistulae usually means an operation. The rationale of all therapeutic efforts is either the healing or the closure of the fistula without additional impairment of continence. This means that the choice of the surgical procedure depends on the path of the fistula in relation to the sphincter apparatus.

In anal fistulae which do not affect vital proportions of the sphincter, such as submucosal, sub-ano-dermal, subcutaneous intersphincteric or distal transsphincteric fistulae, the fistulotomy (deroofing) does not endanger the sphincter function and is therefore, without dispute, the standard treatment of choice. The fistula roof is divided and the edges, containing the skin, mucosa, and subcutaneous tissue and maybe parts of the sphincter muscle, are reduced. A perianal enlargement of the wound into the so-called drainage triangle guarantees constant evacuation of secretions until the wound has completely healed.

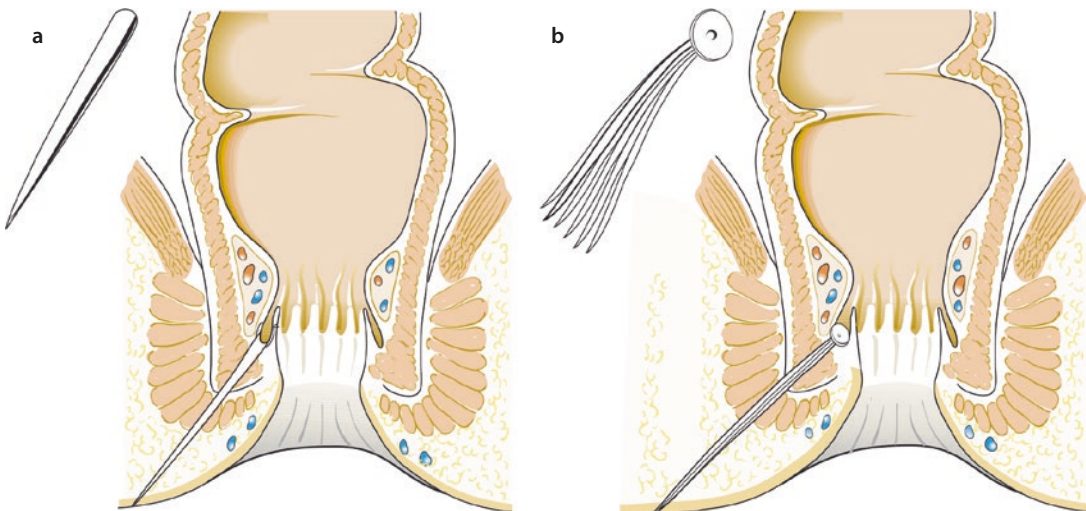
In high transsphincteric, suprasphincteric, or extrasphincteric fistulae, a fistulotomy or fistulectomy is not possible, since this would invariably result in clinically relevant sphincter destruction

with concomitant incontinence. Here, the temporary placement of a non-cutting seton, either a nonabsorbable thread or a rubber/silicone loop, into the fistula path has proven to be very effective in order to guarantee patency of the fistula, avoid retention of secretions, and achieve inflammation-free local tissue conditions. Only after this initial therapy, more sophisticated operative steps may take place to definitively close the fistula:

- The advancement flap is a plastic closure where, after debridement of the fistula path and suture of the internal opening, a u-shaped flap of mucosa/submucosa or even rectal wall is advanced to solidly cover this area from the inside.
- Another procedure is fistulectomy with primary sphincter reconstruction, where after division of the fistula roof and debridement or excision of the fistula, the sphincteric muscle edges are sewn together again.

Both procedures have a healing rate of about 70–80%, but there is a considerable risk of post-operative incontinence.

More recently, some minimally invasive, sphincter-preserving procedures have been developed over the last couple of years. Their purpose is occlusion of the fistula path (fistula plug, ■ Fig. 9.13) and thermic destruction (FiLaC: laser; VAAFT: HF electrocoagulation), the interruption of the fistula path in the intersphincteric area (LIFT = Ligation of the Intersphincteric Fistula Tract), and the dynamic occlusion of the internal fistula opening by means of an elastic metal clip (OTSC proctology, ■ Fig. 9.14).



■ Fig. 9.13 a, b Fistula plugs





■ **Fig. 9.14** OTSC proctology (By permission from Ovesco Endoscopy AG, Tübingen)

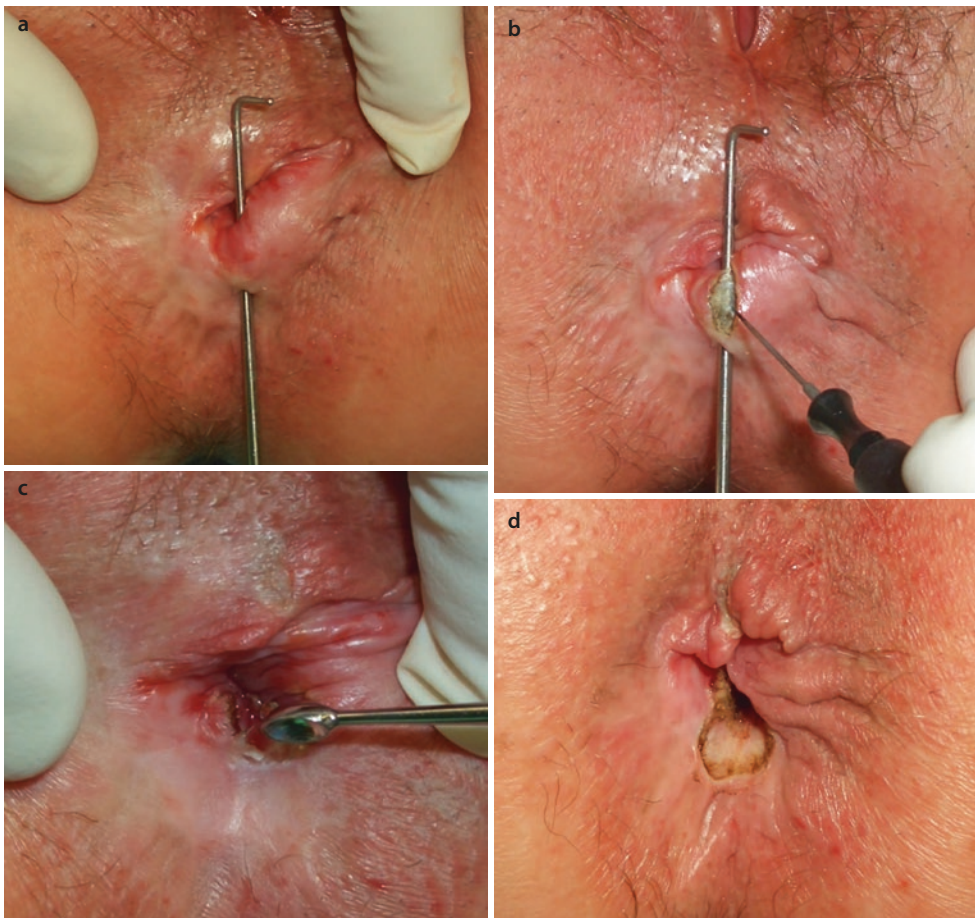
**Indication** For the endoscopist, aside from his diagnostic task, only limited therapeutic options are preserved. As a maximum, these are the deroofing of superficial fistulae under local anesthesia and/or the introduction of setons to avoid abscess formation and allow for reliable drainage.

**Personnel Requirements** Next to the acting doctor, the presence of one assistant is useful to manage the needed instruments, thereby reducing therapeutic time to a minimum.

**Instrumental Requirements** Apart from the usual proctoscopic tools, the following are to be prepared:

- Local anesthesia
- Fistula probe or hook
- Sharp curettage spoon
- Nonabsorbable woven thread (e.g., polyester or silk) or rubber/silicone seton (vessel loop)
- HF needle electrode and HF generator
- Dressing material

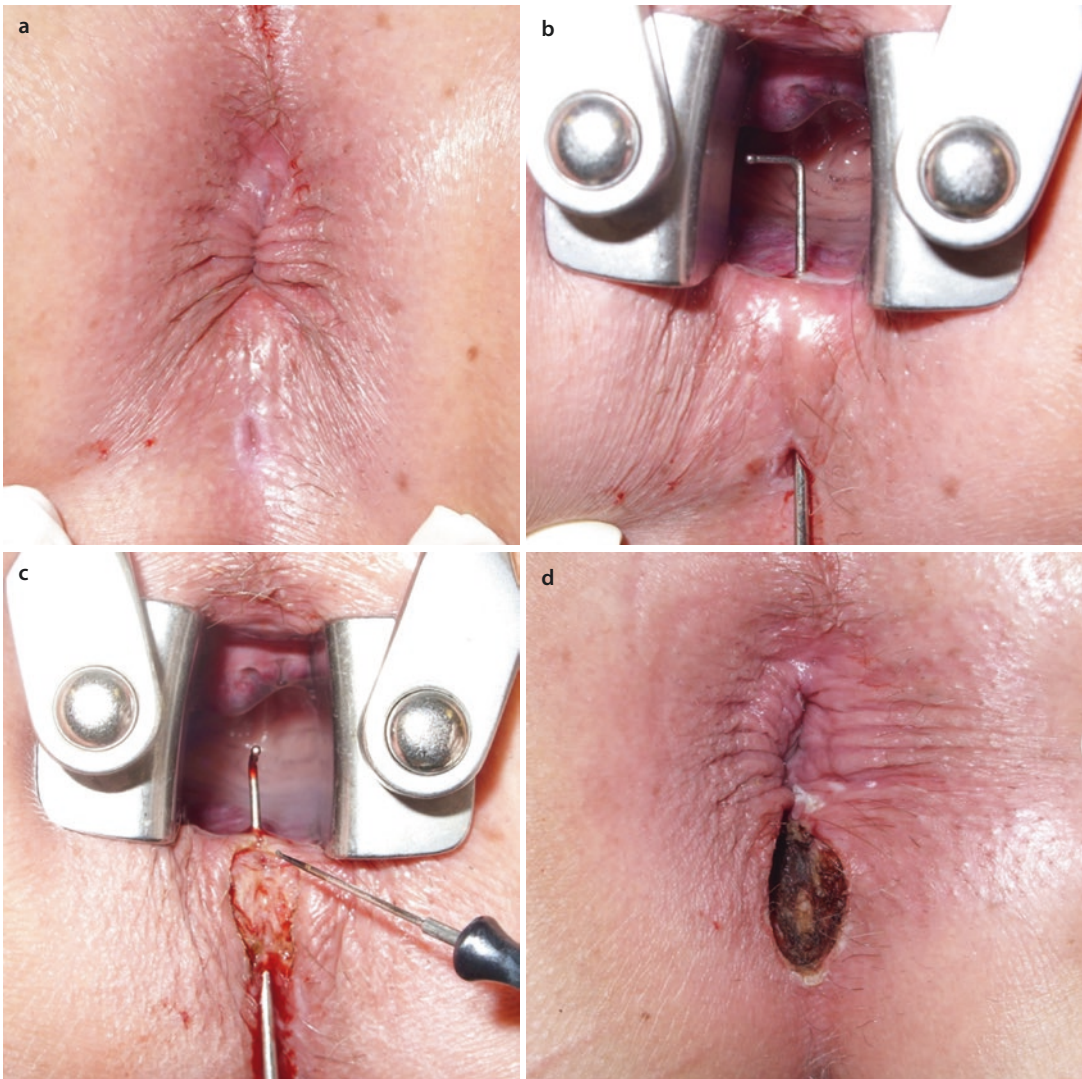
**Practical Procedure** If it is clear that the fistula runs superficially over a short distance (e.g., subanodermal, subcutaneous, or intersphincteric; ■ Figs. 9.15 and 9.16) and thus may be divided, the first step is



■ **Fig. 9.15** Fistulotomy of a subcutaneous anal fistula in scar tissue: **a** preoperative situation with external opening at 6 o'clock lithotomy position, **b** fistulotomy by

deroofing the fistula with the HF electrode, **c** debridement of the posterior fistula wall with a sharp spoon, and **d** postoperative result with external wound opening





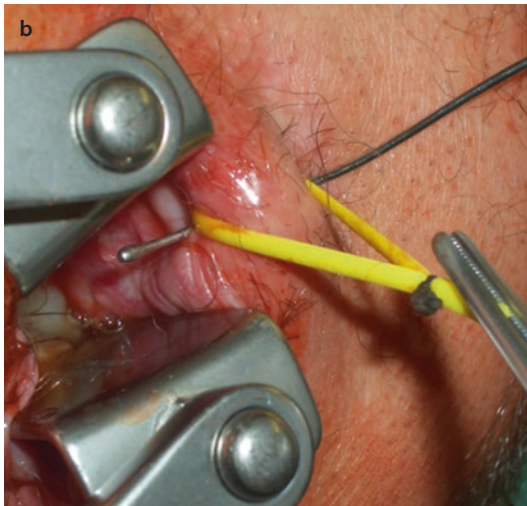
■ **Fig. 9.16** Fistulotomy of a distal transsphincteric anal fistula (general anesthesia!). **a** Preoperative situation with external opening at 6 o'clock lithotomy position. **b** Retro-

grade probing with fistula hook. **c** Fistulotomy by deroofing with HF needle electrode. **d** Postoperative result with external wound opening

the infiltration anesthesia of the surrounding tissue including the highly sensitive anoderm. By retrograde probing, the fistula is intubated via the external opening. The fistulotomy is then carried out by means of HF electrode, followed by debridement of the posterior fistula wall. After reduction of the wound edges, the distal wound portion is enlarged to form an external drainage wound, in order to maintain an excellent drainage of wound secretions.

If inadvertently the probing of the fistula should show a more complex course resulting in

a contraindication to the planned division, a non-cutting seton (thread, rubber/silicone drain; ■ **Fig. 9.17**) should be introduced into the fistula. To achieve that, after clear identification of the internal opening, the nonabsorbable seton is tied to the tip of the probe and then pulled antegradely through the whole fistula. Either this thread is then tied to itself to create a closed loop, or it is used for the pull-through of a rubber/silicone seton or vessel loop which is tied as well.



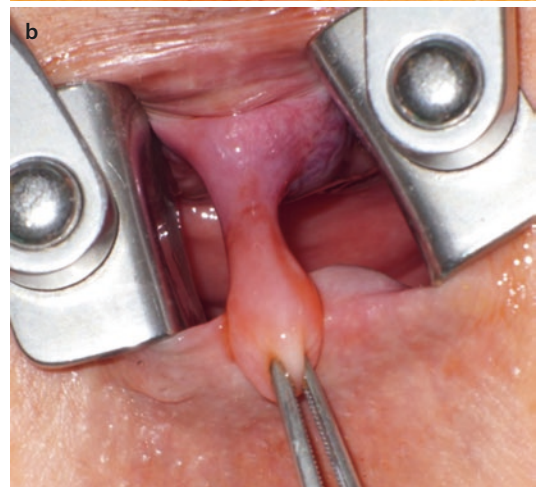
**Fig. 9.17** Drainage and marking of an anal fistula **a** by a nonabsorbable suture and **b** by a silicone vessel loop

#### Tip

For better anal hygiene, a rubber/silicone loop for fistula drainage should be chosen rather than a woven, non-resorbable thread, even if the latter one is thinner. The rubber/silicone seton, however, should not be tied to itself because of the size of the resulting node, which might irritate the anal region. Just recently, silicone loops have been introduced that have a plug-in mechanism with no need for nodes.

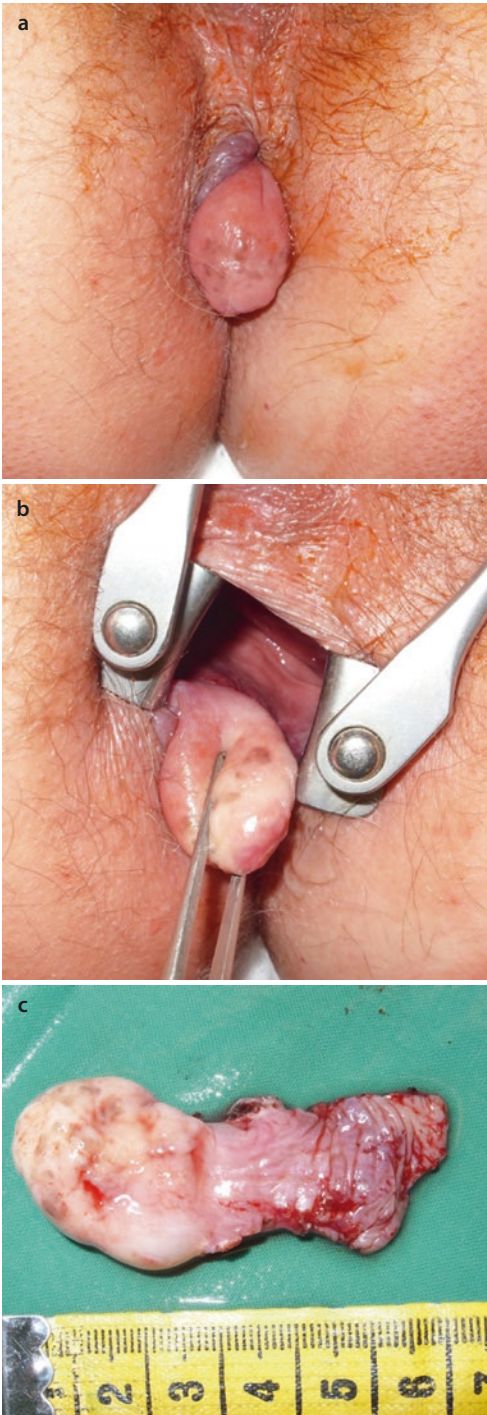
### 9.3 Anal Polyps

Anal polyps typically are benign tumors of the anal channel which don't follow the adenoma/carcinoma sequence as rectal tumors do. Most anal polyps are hypertrophic anal papillae which originate from the dental line. They can occur singly or in multiples. Their shape is pedunculated (■ Fig. 9.18) or broad based (■ Fig. 9.19), and they can prolapse out of the anal channel due to steady growth (■ Fig. 9.20). Quite often they are misinterpreted as hemorrhoids (■ Fig. 9.21), particularly because the mechanical irritation can cause bleeding and faults of continence. Probably inflammatory lesions which cause proliferative



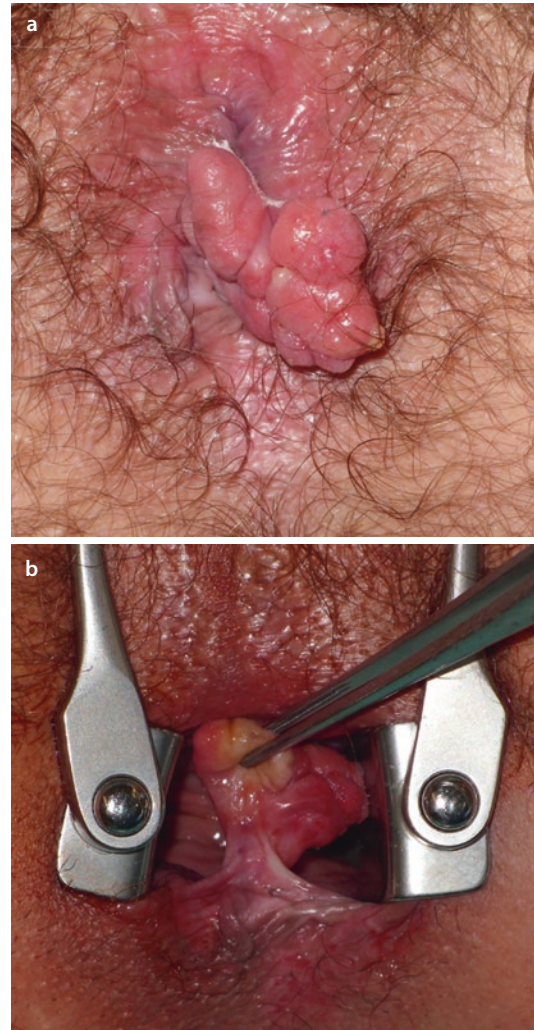
**Fig. 9.18** **a, b** Longitudinal pedunculated anal polyp/hypertrophic anal papilla with prolapse





■ Fig. 9.19 a–c Large and wide prolapsed anal polyp

fibrosis of the anal papillae are the background to the development of anal polyps. A hypertrophic anal papilla can persist as a residuum of a chronic anal fissure.



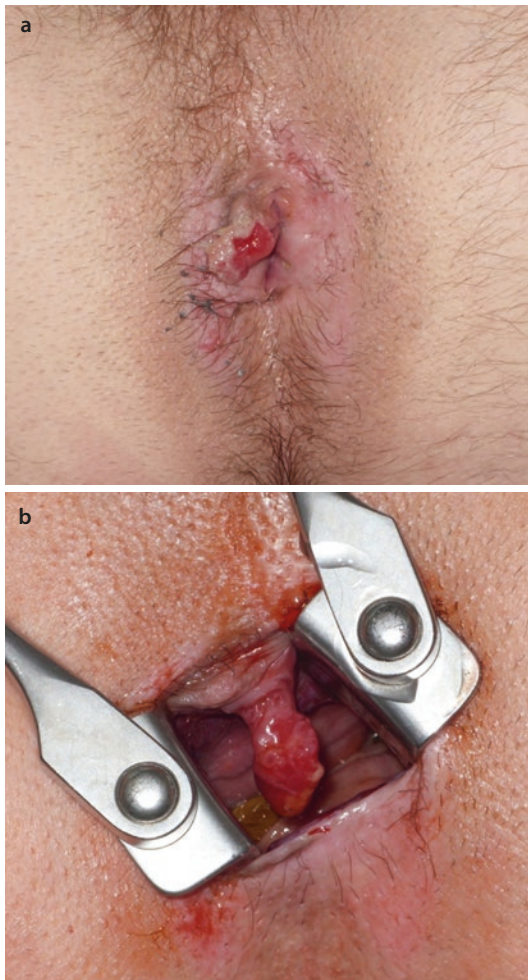
■ Fig. 9.20 a, b Prolapsed anal polyp with irregular polyloid surface structure

**Indication** The removal of a hypertrophic anal papilla may be indicated in cases with distinct prolapse with impairment of continence or with recurrent bleedings.

**Personnel Requirements** In addition to the acting physician, an assistant is recommended to provide the instruments. This is helpful in minimizing the intervention time.

**Instrumental Requirements** In addition to the usual proctological instruments (forward-looking proctoscope), the following are necessary:

- Local anesthetics
- High-frequency needle-knife or HF snare and HF generator



**Fig. 9.21** a, b Vulnerable anal polyp with chronic inflammatory alteration of the surface (may be misinterpreted as bleeding prolapsed hemorrhoidal node)

**Practical Course** The anal polyp is exposed with the straight open proctoscope. After local anesthesia, the polyp will be cut close to its basis with the HF knife or the HF snare.

#### Tip

Removed polyps should be examined by histopathology to rule out anal intraepithelial neoplasias (AIN) or carcinoma.

## 9.4 Mariscas

Mariscas are frequently found skin flaps at the edge of the anus which can be solitary and multiple or even completely surrounding the orifice.



**Fig. 9.22** Idiopathic mariscas

They are of varying size and, according to possible inflammatory characteristics, may be soft and lobulated, hard or edematous, and swollen.

Aside from idiopathic mariscas (Fig. 9.22) which are a hyperplasia of the skin of the anodermal area, they may be secondary to healed perianal venous thrombosis (Fig. 9.23; see Sect. 9.5) or be found in chronic anal fissures (in this case, they are called «sentinel piles» or «sentinel folds»; see Sect. 9.7).

**Indication** Mariscas may be removed if cleaning of the anus becomes difficult presenting an anal hygienic problem.

**Personnel Requirements** In addition to the acting doctor, the presence of one assistant is useful to pass the necessary instruments in order to reduce the required treatment time to a minimum.

**Instrumental Requirements** Instrumental requirements are:

- Local anesthetic
- Forceps
- Scissors or HF needle electrode with HF generator
- Dressing material

**Practical Procedure** After application of local anesthesia, the mariscas are either cut away by the HF needle or the scissors at the level of the surrounding perianal skin. The wounds, following hemostasis, should be left open for secondary healing.





**Fig. 9.23** a, b Mariscas as secondary alterations in chronic anal fissure (hypertrophic anal papilla)

#### Tip

In multiple or completely circular mariscas, a short general anesthesia means great comfort to the patient. The circular procedure is, however, prone to form a scar with stenosis. Therefore, multiple metachronous procedures rather than one single operation are recommended. Perhaps plastic surgical interventions may become necessary.

## 9.5 Perianal Venous Thrombosis

Perianal venous thrombosis is a local, intravascular thrombosis in veins running subcutaneously and subanodermally at the edge of the anus. Erroneously, these thromboses are often referred to as external

hemorrhoids. This is incorrect since true hemorrhoids are made of an arteriovenous vascular conglomerate, the corpus cavernosum recti, whereas the perianal venous thrombosis is located inside true veins.

The reason for a perianal venous thrombosis, following Virchow's triad (stasis, endothelial alterations, hypercoagulability of the blood), are hemodynamic factors, for example, excessive pressure during defecation both in constipation and diarrhea. An additional contributing factor is increased pressure at the pelvic floor, which may occur during physical strain, exercise, long-lasting sitting during journeys, and during pregnancy or childbirth.

Perianal venous thromboses become evident as a sudden nodular and very painful swelling at the edge of the anus.

Morphologically, they show a blueish, pale, thrombotic color (■ Fig. 9.24). Their size might vary from a few millimeters to several centimeters. In their extreme form, by dislocation of the anoderm due to edema, they might present as a partly thrombosed anal prolapse (■ Fig. 9.25).

#### Tip

The differential diagnosis between perianal venous thrombosis and thrombosed hemorrhoid is made by palpation or by proctoscopy: in perianal venous thrombosis, the anal canal appears normal, whereas in a thrombosed hemorrhoid, the thrombosis has an extension along the complete anal canal starting internally and reaching distally.

Therapy of perianal venous thrombosis depends on the subjective pattern of patient's complaints. As long as the pain is tolerable, a conservative approach using topical anesthetic ointments, e.g., lidocaine ointment, and systemic analgesic drugs is justified. Within a few days, the lasting pain produced by excessive elongation of the anoderm will gradually subside. The thrombosis is dissolved within days or a few weeks by organization, resorption, and recanalization. In rare cases, the thrombosis may cause a pressure-induced necrosis, with subsequent spontaneous discharge of thrombotic material.

**Indication** If the pain is unbearable and the time for spontaneous dissolution of the thrombosis is expected to be too long, an operative intervention may be considered. The sole incision of the



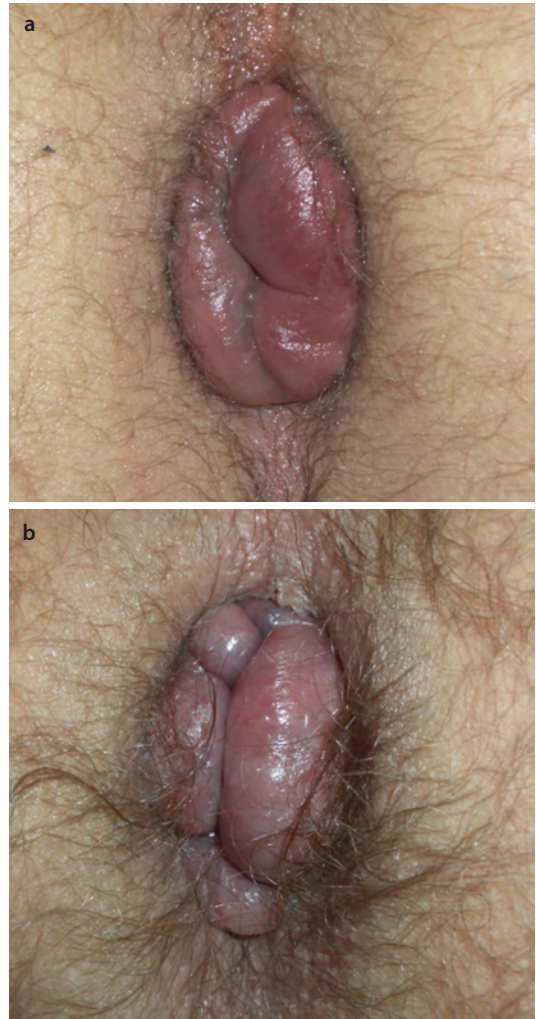
■ Fig. 9.24 a, b Perianal venous thrombosis

thrombosis with expression of the thrombus has a high recurrence rate and is therefore advised against. The adequate therapy is a wide deroofing of the thrombosed veins or the complete excision of the thrombosed vein.

**Personnel Requirements** In addition to the acting doctor, the presence of one assistant is useful to pass the necessary instruments, in order to reduce the required treatment time to a minimum.

**Instrumental Requirements** Instrumental requirements are:

- Local anesthetic
- Forceps
- Scissors or HF needle electrode with HF generator
- Dressing material



■ Fig. 9.25 a, b Anal prolapse with partial thrombosis

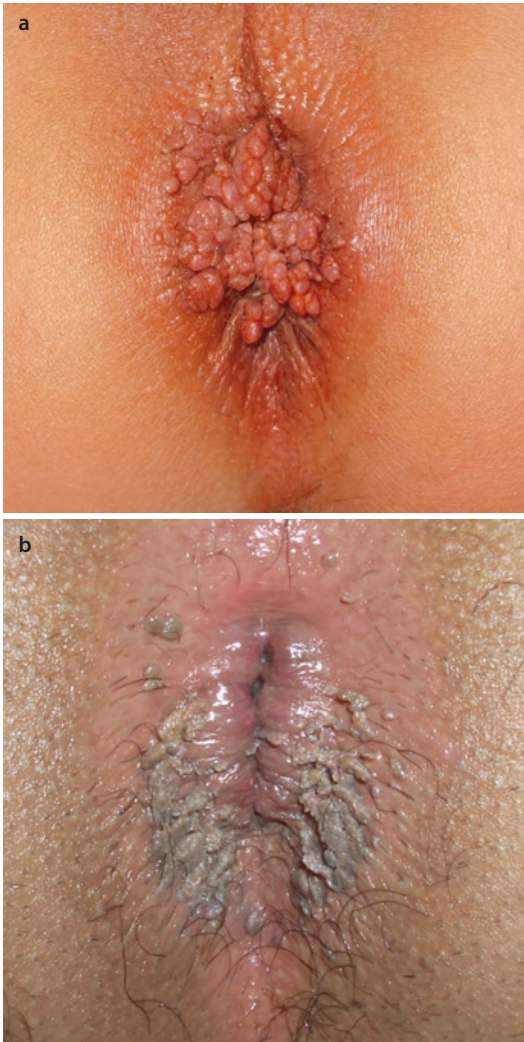
**Practical Procedure** Following local anesthesia of the base of the perianal venous thrombosis, a wide deroofing of the thrombosed vessel or a complete excision of the thrombosed vein is carried out, using scissors, scalpel, or HF needle electrode. Following hemostasis, the wound remains open for secondary wound healing.

## 9.6 Anal Neoplasias

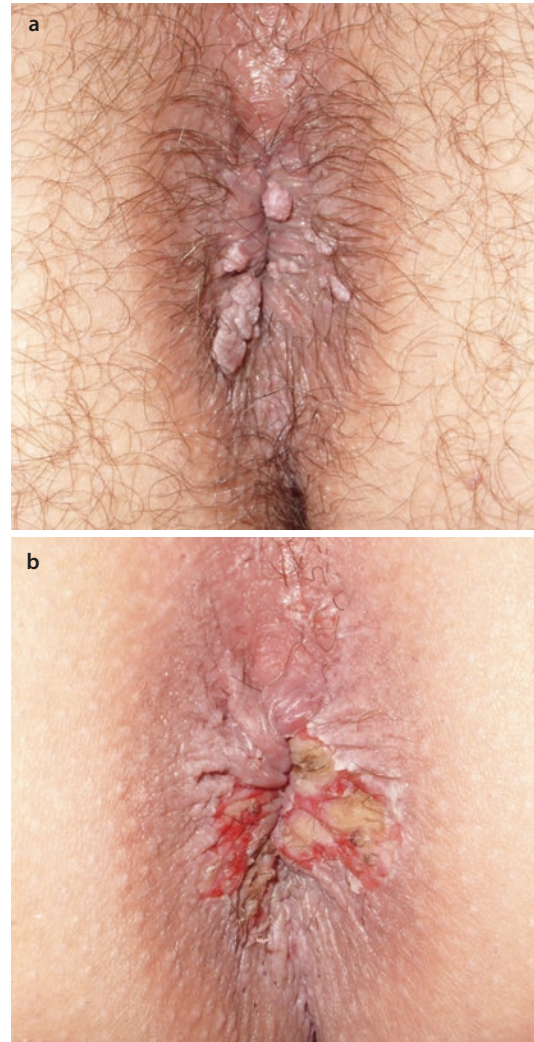
### 9.6.1 Condylomata Acuminata (AWMF Anale Feigwarzen)

Condylomata acuminata are anogenital warts induced by human papilloma virus (HPV). They may occur peri- as well as intra-anally. (■ Fig. 9.26). The appearance and size vary greatly:





■ Fig. 9.26 a, b Multiple circular perianal condylomata acuminata



■ Fig. 9.27 Perianal condylomata acuminata, a before and b after excision using wet-field technique

from pinhead size and solitary up to multiple confluent circular and cauliflower-shaped large exophytic tumors, which at times may show special forms such as locally destructive Buschke–Loewenstein tumors or even anal carcinomas.

They are most often regarded as sexually transmitted disease by way of HPV types 6, 11, and 18, sometimes also caused by smear infection.

! **Partners of patients with condylomata acuminata should be screened proctologically, gynecologically, and urologically as well. In addition, immune-compromising diseases such as HIV or other venereal diseases must be excluded.**

There is a spontaneous healing rate of about 30%. Small perianal condylomata may be treated topically, e.g., by podophyllotoxin or imiquimod cream.

**Indication** Larger, multiple, and intra-anal condylomata are operatively destroyed. Depending on the area involved, this may happen under either local or short-lasting general anesthesia. Since condylomata grow strictly intraepithelially, the treatment of choice is usually superficial heat destruction, e.g., by HF electrocoagulation. By a continuous water or gel application (wet-field technique, ■ Fig. 9.27), a deeper thermal injury of the skin may be avoided (also known as wet-shaving technique). Due to their malignant character, more extensively growing



**Fig. 9.28** Buschke–Loewenstein tumor. **a, b** Preoperatively. **c** Following radical excision (intra-anal compress). **d** After completed secondary healing

condylomata such as Buschke–Loewenstein tumors have a malignant potential and have therefore to be radically resected (■ Fig. 9.28).

**Personnel Requirements** In addition to the acting doctor, the presence of one assistant is useful to pass the necessary instruments, in order to reduce the required treatment time to a minimum.

**Instrumental Requirements** Instrumental requirements are:

- Local anesthetic
- Forceps and scissors

- HF loop or HF ball tip or bipolar forceps with HF generator
- Gel or saline or water
- Dressing material

**Practical Execution** Following local anesthesia and removal of some condylomata for histology and determination of the HPV type, the superficial thermo-destruction is carried out, while the area is constantly cooled by applying liquid or gel. Finally, the operative field is visually and haptically controlled for complete removal of all condylomata.



! During thermo-destruction of condylomata, the vaporization process liberates viral particles into the room air. Therefore, a protection mask for the nose and mouth and protective goggles are required.

### 9.6.2 Anal Carcinoma (AWMF Anale Dysplasien und Analkarzinom bei HIV-Infizierten)

The anal carcinoma is a rare malignant epithelial tumor entity, in which two forms, the carcinoma of the anal edge (■ Fig. 9.29) and of the anal canal (■ Figs. 9.30 and 9.31), are differentiated.

Relevant risk factors for its development are HPV infection, immune deficit (HIV, posttransplant status), irradiation, or a chronic inflammatory bowel disease. Only very rarely do anal carcinomas originate de novo; most will develop from an anal intraepithelial neoplasia (AIN), e.g., condylomata, Bowen's disease, or Bowenoid papulosis. In addition, other premalignant anal diseases such as extramammary Paget's disease, basalioma, cutaneous T-cell lymphoma, and lichen sclerosus et atrophicus may be regarded as precursors.

The clinical sign is a hard or verrucous or exulcerating tumor with itching sensation, which may become symptomatic with wetting, pain, or bleeding.

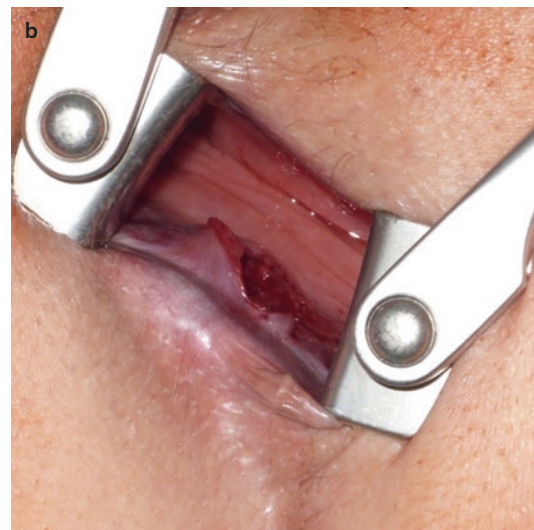
Treatment of anal carcinomas is different between the carcinomas of the anal edge and of the



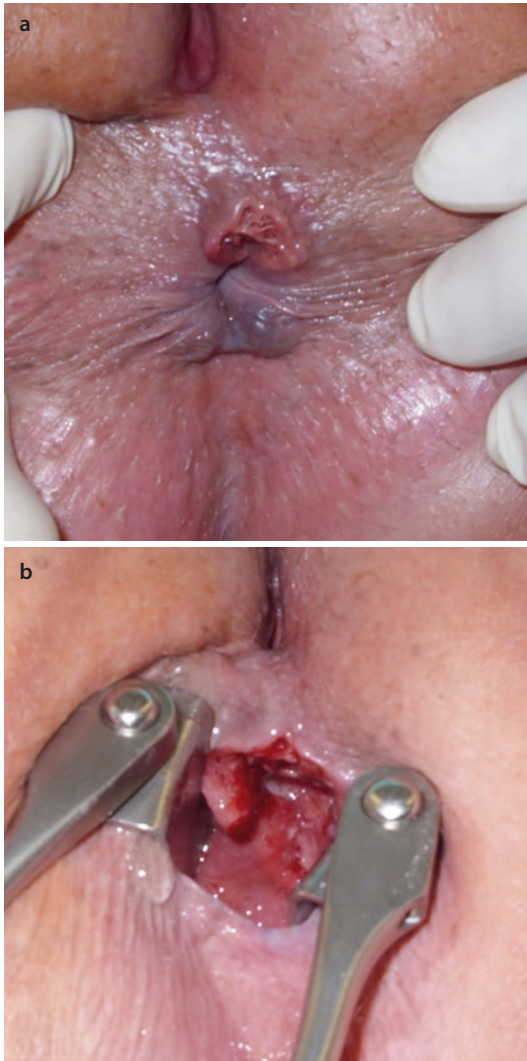
■ Fig. 9.29 Anal carcinoma

anal canal: in tumor stages T1 and T2 and G1 or G2 of carcinomas of the anal edge, a primary surgical excision with adequate safety margin may be sufficient. Tumors of the anal edge that are more advanced or are in close relation to the sphincter apparatus are usually treated like tumors of the anal canal (except for Tis and some T1 tumors) by a combined radio-chemotherapy normally using 5-fluorouracil (5-FU) and mitomycin C.

**Indication** The task of the endoscopic or proctologic doctor in the case of anal carcinoma is restricted to taking biopsies to secure the histological diagnosis.



■ Fig. 9.30 a, b Anal carcinomas, originally misinterpreted as anal fissure



**Fig. 9.31** a, b Rectal carcinoma with infiltration of anal canal and anal edge (adenocarcinoma, anal carcinoma usually are squamous cell carcinoma)

**Personnel Requirements** In addition to the acting doctor, the presence of one assistant is useful to pass the necessary instruments, in order to reduce the required treatment time to a minimum.

**Instrumental Requirements** Instrumental requirements are:

- Local anesthetic
- Forceps
- Biopsy clamps or forceps, scissors or scalpel
- Dressing material

**Practical Execution** In small carcinomas of the anal edge, an excisional biopsy under local anesthesia is feasible most of the time. In advanced carcinomas of the anal edge and in carcinomas of the anal canal, brief general anesthesia is advisable. Here, by means of the available instruments mentioned, several deep biopsies should be taken from different areas of the tumor.

**!** In ulcerated tumors, the tissue biopsy should not be taken from the necrotic central ulcer ground but rather from the vital circumferential edge. A burning of the biopsy by HF coagulation must also be avoided.

## 9.7 Anal Fissure (Heitland 2012)

Anal fissure is a most painful anal disease where a longitudinal ulcer-like defect in the highly sensitive anodermal region is found. The cardinal symptom is defecation pain, which starts with stool passage and will last for several minutes up to hours. Eighty to ninety percent of anal fissures are localized at the posterior commissure at the 6 o'clock lithotomy position; 10–15% are ventral.

**!** In all cases of a lateral position of a fissure, a malignant disease must be suspected.

The crucial factor for the onset of an anal fissure is a hard stool consistency causing a superficial disruption of the anoderm. In addition, a reflexive anal spasm may cause ischemia of the tissue, which then will aggravate the situation and lead to persistence or progression of the fissure.

If no healing is achieved, every acute anal fissure will become chronic within 2–3 months. Then a hypertrophic anal papilla or a («sentinel fold») is a constant finding.

### ■ Conservative Treatment

As a causative treatment and basic therapy of a fissure, an adequate regulation of bowel consistency using fiber-rich diet and sufficient liquid intake should be the start. In addition, stool regulatory preparations such as psyllium (*Plantago ovata*) and macrogol are beneficial.

For analgesia, the intra-anal application of local anesthetic ointments or gauze-armed suppositories is helpful. The topical application of glyceryl trinitrate (GTN) ointment may reduce the sphincter tone. This can contribute to an improved sub-odermal perfusion and thus help to heal the fissure.

#### Tip

GTN ointments may have the side effect of headaches. As an alternative to the commercially available GTN ointment, a specially and individually designed mixture preparation of calcium antagonistic drugs such as 2% diltiazem and 0.2% nifedipine ointment may be successfully used.

#### ■ Operative Treatment

**Indication** The operative treatment is indicated after failure of the conservative attempts or if marked secondary sequelae of the fissure are making a conservative healing unlikely. The operative standard treatment of choice is fissurectomy (■ Fig. 9.32).

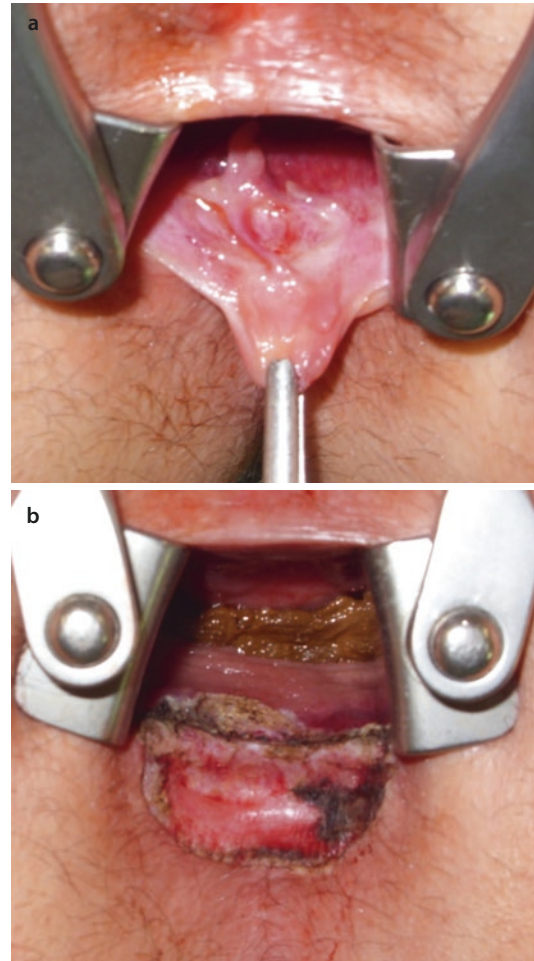
**Personnel Requirements** In addition to the acting doctor, the presence of one assistant is useful to pass the necessary instruments, in order to reduce the required treatment time to a minimum.

**Instrumental Requirements** Instrumental requirements are:

- Local anesthetic
- Forceps
- HF needle electrode with HF generator
- Dressing material

**Practical Execution** If the fissure is not too excessive and pain is tolerable, fissurectomy may be carried out under local anesthesia. However, in most cases, short general anesthesia is superior.

The first step is a gentle and slow manual sphincter dilatation for the reduction of the usu-

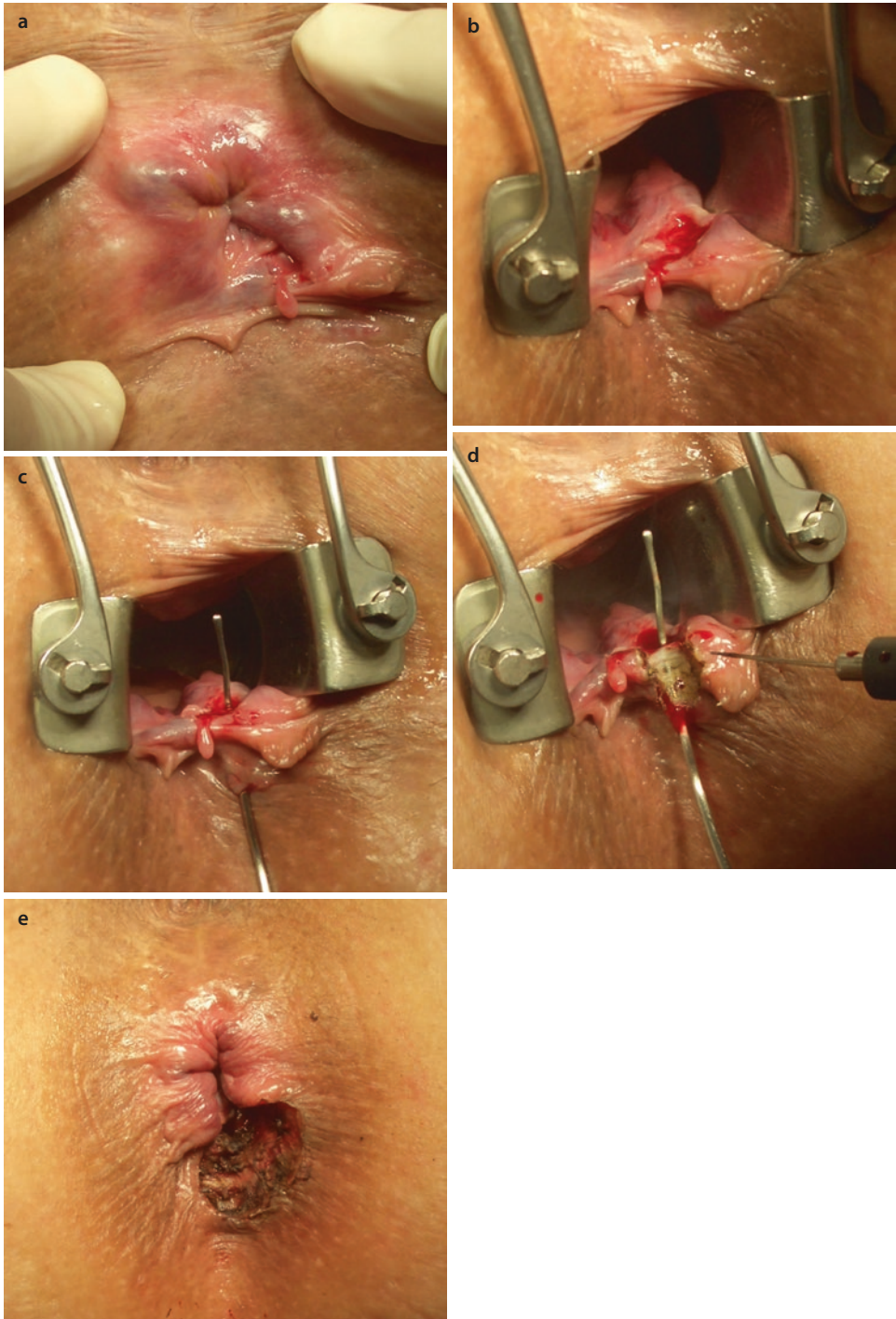


■ Fig. 9.32 Chronic anal fissure. **a** Preoperative finding with hypertrophic anal papilla. **b** Postoperative result following fissurectomy

ally existing anal spasm. Then the fissure, together with all fissure edges and the fissure ground, is completely excised using the HF electrode, meticulously preserving the internal anal sphincter muscle (■ Fig. 9.33). The perianal drainage wound then helps with uneventful secondary wound healing.

! **A lateral or partial sphincterotomy, which used to previously be the treatment of choice, should be regarded as obsolete because of its irreversible impact on continence in the long term.**





**Fig. 9.33** Chronic anal fissure with intersphincteric anal fistula. **a, b** Preoperative finding. **c** Probe in fistula. **d** Fistulotomy by HF electrode with cutting of fibers of the

internal sphincter muscle. **e** Postoperative result following fistulectomy and fissurectomy with external wound opening



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