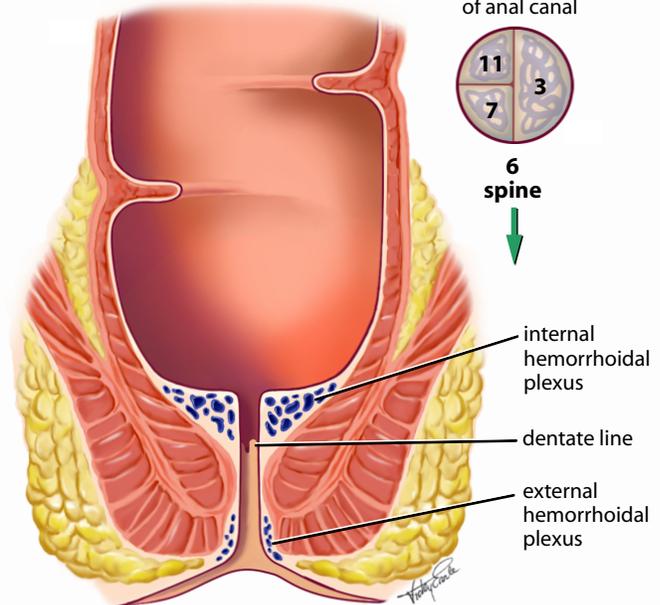




Surgical Anatomy of the Anal Canal

The distal 3 cms of the bowel is the anal canal and is lined by squamous epithelium (skin) called anoderm. This anoderm can discriminate between gas, fluid and solid material, and removal of this tissue can result in continence problems. It is in this area that a fissure occurs and this is the area that needs application of Nitroglycerin to be effective. Many pharmacists are determined that application of ointment with a finger into the anal canal is internal application to mucosa, but this is not true and can result in application outside the anus which is less effective in treatment. The anoderm is surrounded by the intrinsic sphincter with the levator ani (the important muscles that control continence) more laterally. Proximal to the anal canal and above the dentate line is a space – the rectal ampulla – and the three hemorrhoidal cushions in this area come together above the anal canal like flaps and aid in continence (figure 1). These are covered by columnar mucosa which starts above the dentate line. These are the cushions which can become internal hemorrhoids which by definition arise above the dentate line. There are no pain nerve fibers here. The hemorrhoidal plexuses extend under the anoderm to the external hemorrhoidal plexus and with long standing hemorrhoids

Fig. 1a



it becomes difficult to decide whether the outside swelling is slipping or prolapse of the mucosa overlying the internal hemorrhoid or lymphedema (swelling) and repeated thromboses (clotting) of the external plexus. The determinant is the covering of the external tag – if it is squamous epithelium it is a true external skin tag. If the outer aspect is squamous epithelium and the inner margin is columnar mucosa, it is a 3rd or 4th grade internal hemorrhoid. Correct banding normalizes the size of the hemorrhoidal cushions and does not pick up the anoderm or the underlying muscle. The mucosa does not feel pain but the anoderm does.



Definitions

Internal hemorrhoid: a dilated varicose group of vessels arising from the junction between the internal and mid hemorrhoidal plexus located above the dentate line and covered by columnar mucosa (figure 2). The hemorrhoids are classified according to degree of prolapse (Banov¹) :

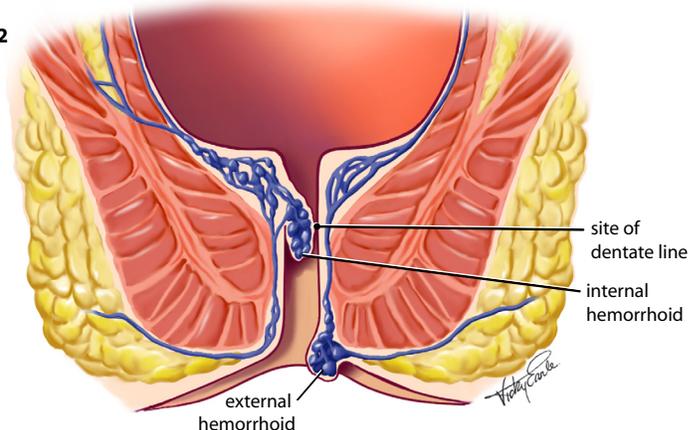
Grade 1: There is a tuft of internal hemorrhoidal tissue but no prolapse from the anal canal. These produce painless bleeding.

Grade 2: These bleed but also prolapse from the anal canal when the patient strains. They retract after the bowel movement and often the patient does not even know they are prolapsing. They may be demonstrated by watching the patient in the act of straining or identified on anoscopic examination by grasping the hemorrhoid with a forceps and gently pulling it externally.

Grade 3: These are easily identified because they prolapse with a bowel movement and remain out. The patient has to replace them manually. Grade 3 hemorrhoids may be associated with bleeding and perhaps with an aching pain.

Grade 4: These remain prolapsed externally all the time and won't stay reduced. There is

Fig. 2



often a mucoid discharge from the hemorrhoids along with bleeding, and the surface may undergo metaplasia which is evidence of chronic external exposure.

In each of these cases the external hemorrhoidal component may be simultaneously involved. The external hemorrhoids may swell and become painful from inflammation and/or thrombosis.

External hemorrhoids: these can be confused with prolapsed internal hemorrhoids but strictly speaking an external hemorrhoid is a hemorrhoid in the external hemorrhoidal plexus. These can develop clot(s) in them about the size of a pea. The probable cause is again high sphincter pressure resulting in stasis of blood and then clotting and an accompanying fissure is common.

1. Banov L Jr, Knoepp LF Jr, Erdman LH, Alia RT. Management of hemorrhoidal disease. J S C Med Assoc 1985;81:398-401.