

Chapter 19 Buttockectomy

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BACKGROUND

- The gluteus maximus (buttock) is a common site for high- and low-grade soft tissue sarcomas. The gluteus maximus is a “quiet area” for soft tissue sarcomas and rarely become symptomatic until they are extremely large. Traditionally low- and high-grade soft tissue sarcomas of the buttock were treated with a posterior cutaneous flap hemipelvectomy. Today, most sarcomas of this muscle can be resected with safe margins; hemipelvectomy is not required. Advances in limb sparing surgical procedures have reduced the need for hemipelvectomy for tumors in this region.
- Tumors of the gluteus maximus are often confined to this muscle and do not extend to the underlying retrogluteal space or involve the sacrum or femur. The most significant structure in the retrogluteal space that must be evaluated is the sciatic nerve. Minimal reconstruction is required. During the postoperative period it is important to take measures to prevent the formation of large postoperative seromas. The functional outcome of a resection of the gluteus maximus is a minimal deficit in hip extension only. The gait is normal.
- A hemipelvectomy rarely is required for a soft tissue sarcoma of the buttock unless it is extremely large or accompanied by fungation, infection, or extension into the ischiorectal space, pelvis, and hip. Direct sacral or iliac bone involvement, which is rare, often necessitates an amputation.
- Today about 90% of soft tissue sarcomas arising in the buttock can be resected and treated adequately by a limb sparing surgery. Low-grade soft tissue sarcomas of the gluteus maximus usually require surgery only; high-grade soft tissue sarcomas in this region, like those in other anatomic areas, are also usually treated with chemotherapy and/or radiation preoperatively and/or postoperatively.
- The authors favor the use of induction chemotherapy followed by a limb-sparing resection when possible for high-grade soft tissue sarcomas. The field is treated with postoperative radiation if required.
- The major indications for an amputation are extremely large sarcomas that involve the adjacent bone, the sciatic nerve, or the ischiorectal fossa.

ANATOMY

- The gluteus maximus arises from the sacral lamina, iliac crest, and ischium. It passes obliquely to its insertion onto the proximal portion of the iliotibial band. This insertion begins above the greater trochanter, passes 4 to 5 cm below the greater trochanter, and then attaches to the adjacent femur. The area underneath the gluteus maximus is termed the retrogluteal space. This area consists of the posterior hip musculature, including the external rotators and portions of the gluteus medius muscle. The sciatic nerve lies in the retrogluteal space. The gluteus maximus does not attach to the retrogluteal structures as it passes over them. This permits easier surgical dissection of

the retrogluteal plane and preservation of the sciatic nerve in many situations.

- As it passes from the sacrum to the femur, the gluteus maximus covers the sacroiliac joint and the sacrospinous and sacrotuberous ligaments, as well as a portion of the ischiorectal fossa.
- Most importantly, the sciatic nerve exits the pelvis through the sciatic notch and passes inferiorly to the piriformis muscle. This nerve lies in close proximity to the posterior fascia of the gluteus maximus; therefore, large tumors of the gluteus maximus may involve the sciatic nerve. The sciatic nerve, however, rarely is involved by the tumor; most often it is displaced around the capsule or pseudocapsule. The inferior gluteal vessels pass below the piriformis muscle to enter the midportion of the gluteus maximus. The inferior gluteal vessels are routinely ligated.

INDICATIONS

- A gluteus maximus resection is indicated for patients with low- and high-grade sarcomas confined to the gluteus maximus.

CONTRAINDICATIONS

- Large tumors that involve the true pelvis or ischiorectal space
- Involvement of the sacrum or ilium
- Sciatic nerve involvement (although, on occasion, the sciatic nerve may be resected)
- Pelvic extension through the sciatic notch

IMAGING STUDIES

Computed Tomography and Magnetic Resonance Imaging

- CT and MRI are most useful in determining the extent of tumor involvement of the gluteus maximus
- Close evaluation determines the involvement of the adjacent sacrum, femur, and sciatic nerve. Attention should be placed on the evaluation of the structures of the retrogluteal space, including the hip joint and sciatic nerve, and ischiorectal fossa. Buttock tumors may extend into the pelvis through the sciatic notch.

Bone Scan

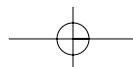
- Tumor involvement may extend to the crest of the ilium, the sacrum, and the proximal femur. These areas should be evaluated by bone scintigraphy.

Angiography

- Angiography is not routinely performed when evaluating tumors of the gluteus maximus. It may be useful in preoperative embolization or preoperative intra-arterial chemotherapy.

Biopsy

- The biopsy site must be in line with the incision for a hemipelvectomy, should one be required. Surgeons performing



a biopsy of tumors of the buttock must, therefore, be familiar with the surgical incisions for both posterior flap and anterior flap hemipelvectomies (see Chaps. ON-21 and ON-22).

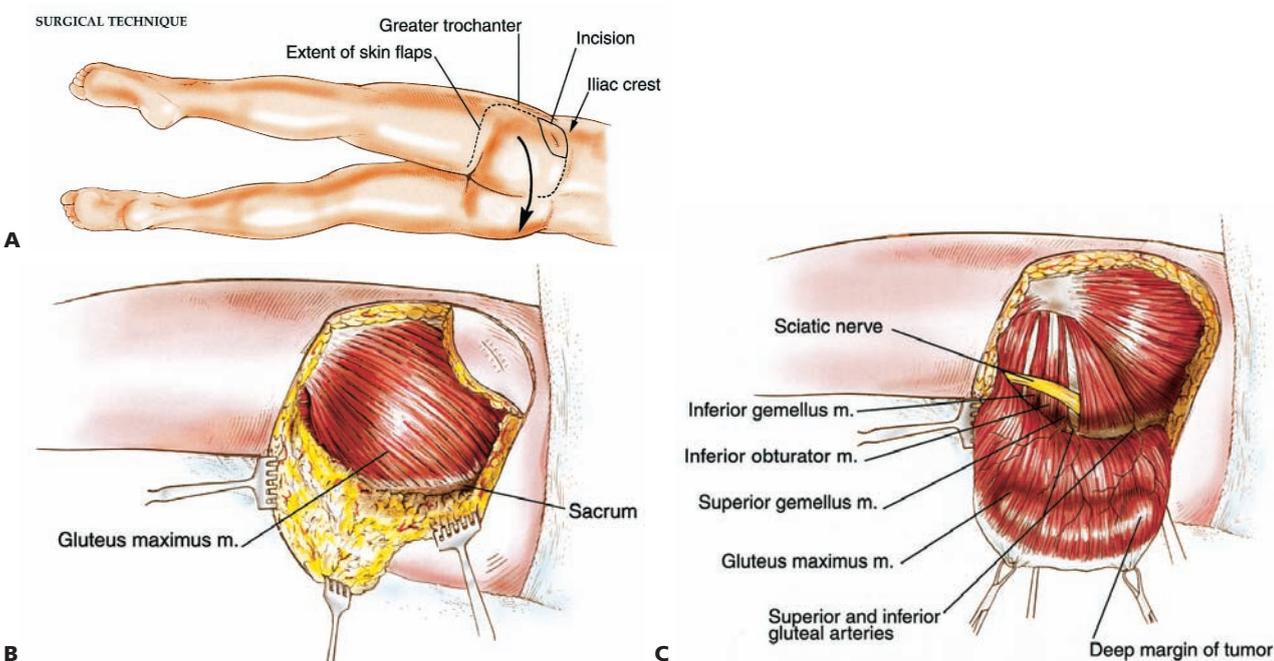
■ The anterior flap hemipelvectomy, as described by Sugarbaker et al.,¹ is preferred for large sarcomas of the buttock area. In this procedure the entire musculature and skin are removed with the amputation, and the anterior myocuta-

neous flap, consisting of the quadriceps muscle, is used to close the defect.

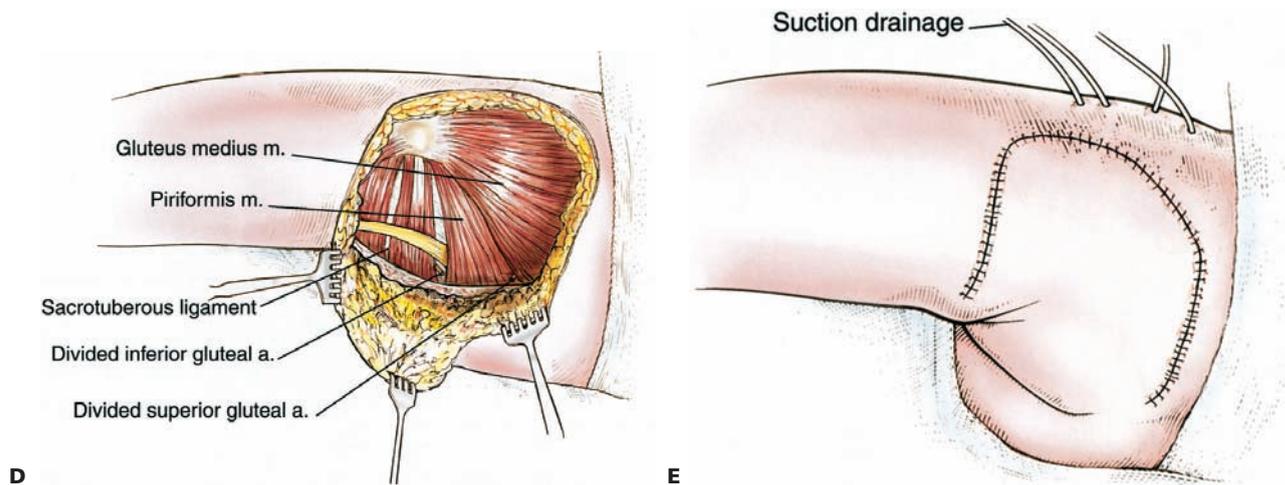
■ If a posterior flap is used, care must be taken not to contaminate the posterior skin or fascia. The biopsy site must, therefore, be along the lateral aspects of a posterior incision and must avoid the greater trochanter, sciatic nerve, ischioanal fossa, and greater trochanter.

BUTTOCKECTOMY

- A large curvilinear incision is made beginning at the posterior aspect of the crest of the ilium, curving distally following the gluteus maximus muscle along the iliotibial band (**TECH FIG 1A,B**), passing over the greater trochanter to about 6 cm distal, and then curving posteriorly back toward the inner aspect of the thigh along the gluteal fold. This incision makes it possible to elevate a large posterior flap.
- To determine resectability or operability, the sciatic nerve is identified distal to the resection site. It can be identified between the medial and lateral hamstring muscles or just lateral to the ischium before it passes underneath the gluteus maximus muscle. The nerve is palpated below the gluteus maximus muscle toward the piriformis muscle (**TECH FIG 1C**).
- The gluteus maximus is detached from the iliotibial band throughout its length and from the femur distally. This muscle is then flapped medially to expose the inferior gluteal vessels and nerve, which are then ligated. The sciatic nerve is displaced anteriorly to protect it during the dissection.
- Removal of the gluteus maximus involves detaching this muscle from the sacrotuberous and sacrospinous ligaments, as well as the lamina and sacral alar (**TECH FIG 1D**).
- To prevent a large postoperative seroma, the large posterior fasciocutaneous flap must be tacked down to the remaining underlying muscle very carefully. Multiple large drains are used (**TECH FIG 1E**).
- The patient remains supine for 72 hours to prevent the development of a seroma.



TECH FIG 1 • A. A lateral position is used. The affected extremity is prepped free from the abdominal wall to the foot. The incision extends along the iliac crest and encompasses the biopsy site by 2 to 3 cm and then extends along the greater trochanter and along the gluteus maximus skinfold. The incision permits wide excision of the underlying gluteus maximus muscle and early exploration and preservation of the sciatic nerve. If the tumor is unresectable, an anterior flap hemipelvectomy is required. **B.** A fasciocutaneous flap is elevated and dissected with the electrocautery toward the origin of the gluteus maximus muscle (from the sacrum). This permits exposure of the entire gluteus maximus muscle. The biopsy site is left en bloc with the gluteus maximus muscle. If the tumor is extremely large, only a subcutaneous flap is used, with the deep fascia remaining on the tumor side. **C.** The retrogluteal space, consisting of the hip rotators, abductor muscles, and the sciatic nerve, is seen in this illustration. The gluteus maximus is mobilized from inferior along the deep posterior thigh fascia and released from the iliotibial band up to the iliac crest. It is then dissected to its origin along the sacral alar and the sacrospinous and sacrotuberous ligaments. The sciatic nerve is explored initially by the surgeon placing his hand under the gluteus maximus to ensure that the nerve is free from the tumor. (*continued*)



TECH FIG 1 • (continued) D. The final surgical maneuver to release the gluteus maximus from the surgical bed is the transection through the origin of its muscle from the sacrospinus and sacrotuberous ligaments. Care should be taken not to enter the ischio-rectal space. The ischium should be palpated, and a hand placed above the ischium and below the gluteus maximus for release of the tumor specimen. **E.** The large posterior fasciocutaneous flap is closed, and large suction drainage tubes are placed. The flap is tacked down to the underlying hip rotator muscles and abductor muscles to avoid a postoperative seroma. A pressure dressing is used for 48 to 72 hours, and the patient lies flat postoperatively. (Courtesy of Martin M. Malawer.)

POSTOPERATIVE CARE

- Postoperative radiation therapy is required for high-grade tumors once the flaps are well healed (4 to 6 weeks after surgery).
- Postoperative chemotherapy is given following the radiation therapy.

OUTCOMES

- The only deficit following gluteus maximus resection is weakness with hip extension. Secondary hip extensors enable some hip extension and the patient's gait is virtually normal.
- If the sciatic nerve requires resection there is loss of foot and ankle control, so that the patient requires an ankle-foot orthosis.
- Depending on the level of the sciatic nerve resection, the first branch to the biceps femoris may be intact. If that is the case, good knee flexion will be retained. Knee flexion also depends on the sartorius muscle (innervated by the femoral nerve), the gracilis muscle (innervated by the obturator nerve), and the two heads of the gastrocnemius muscle that insert across the knee joint.

COMPLICATIONS

- The most common postoperative complication is the development of a large seroma, because there is a large dead space with only a subcutaneous flap on top. We have used the quadratus femoris muscle rotated over the sciatic nerve for soft tissue coverage of the nerve.
- Similarly, the piriformis is rotated distally. The flap is carefully tacked down throughout its course in its midportion to eliminate "dead" space. One 20-gauge chest tube and two Jackson-Pratt drains are used, and the remaining portion of the flap is closed. A compressive dressing is utilized for 72 hours.
- In the case of recurrent sarcomas of the buttocks, tumor fungation, massive contamination, or extensive tumor involvement of the adjacent structures, an anterior flap hemipelvectomy is recommended (see Chap. ON-22 for a discussion of this procedure).

REFERENCE

- Sugarbaker PH, Chretien PA. Hemipelvectomy for buttock tumors utilizing an anterior myocutaneous flap of quadriceps femoris muscle. *Ann Surg* 1983;197:106-115.