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What's New in ACS SURGERY

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THE BEST SURGICAL THINKING

The Surgical Implications of Malignant Polyps of the Lower Rectum

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A malignant polyp is defined as an adenoma with invasion of malignant cells into the submucosa of the colon or rectum; it corresponds to a carcinoma of grade T1NxMx in the TNM system. By definition, a malignant polyp has the ability to metastasize to the regional lymph nodes or to distant organs. Anatomically, the rectum is arbitrarily divided into the lower third (0 to 7 cm from the anal verge), the middle third (7.1 to 10 cm), and the upper third (10.1 to 15 cm). A lesion in the lower third of the rectum is unique in that it can be evaluated by palpation, endorectal ultrasound, and transanal biopsy.

Options for radical resection of malignant polyps of the lower rectum include low anterior resection and abdominoperineal resection. Another option for polyps in this area of the rectum is transanal local excision. In the absence of nodal extension, distant metastases, and poor prognostic features, local excision can provide curative therapy. The key to successful local therapy is to select lesions that have a low risk of lymph node metastasis.

Morphologically, two types of polyps exist: pedunculated and sessile. A review of the literature on the risk of lymph node metastases (LNMs) in malignant polyps is confusing. Most

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This Month's Updates

9 CARE IN SPECIAL SITUATIONS

6 Gynecologic Considerations for the General Surgeon

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Gynecologic emergencies, outpatient gynecologic problems, and gynecologic malignancies are discussed.

Diagnosing Ectopic Pregnancy: The Discriminatory Cutoff

Pelvic pain and vaginal bleeding in the first trimester are the complaints most commonly associated with ectopic pregnancy [*see This Month's Algorithm, page 7*]. Critical to the diagnosis of a suspected ectopic pregnancy is the concept of the so-called discriminatory cutoff,[1] which is defined as the serum β–human chorionic gonadotropin (β-hCG) level at which a normal intrauterine pregnancy can be ultrasonographically identified in nearly all patients. With a transvaginal approach, the discriminatory cutoff is usually between 1,500 and 2,500 mIU/ml; however, this value can be affected by the equipment used and by the experience (or inexperience) of the sonographers. If the transvaginal ultrasonogram is nondiagnostic, a serum β-hCG test is performed to establish the serum level relative to the discriminatory cutoff. If an intrauterine pregnancy is not visualized above the discriminatory cutoff, the contents of the uterus are evacuated to distinguish an abnormal intrauterine gestation from an ectopic pregnancy. If the initial β-hCG level is below the discriminatory cutoff, serial β-hCG measurements are required to document a viable or nonviable gestation. With a viable gestation, the β-hCG level should rise by at least 53% in 2 days.[1] A precipitous decline in the β-hCG level suggests a spontaneous abortion; however, if the β-hCG level does not decline by at least 21% to 35% in 2 days (depending on the initial value), an ectopic pregnancy should be suspected.[1]

1. Seeber BE, Barnhart KT: Suspected ectopic pregnancy. Obstet Gynecol 107:399, 2006 [PMID 16449130]

Technique for Radical Hysterectomy

In a simple hysterectomy for benign disease, the vascular pedicles are

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THE BEST SURGICAL THINKING

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published series are small, and many reach dissimilar conclusions. Factors commonly associated with LNM include lymphovascular invasion, poor differentiation, gender, positive margins, extensive budding, microacinar structures, depressed lesions, and deep submucosal invasion.[1] In 1985, Haggitt and colleagues found that the risk of LNM from malignant polyps depended on the depth of invasion into the submucosa.[2] The depth of submucosal invasion has particular importance in the treatment of pedunculated polyps. Haggitt and coworkers categorized the depth of invasion of pedunculated polyps into four different levels: in level 1, invasion is into the head of the polyp; level 2, invasion to the neck; level 3, invasion to the stalk; and level 4, invasion to the base of the stalk or on the bowel wall. All sessile lesions are classified as level 4.

The risk of LNM for polyps of Haggitt level 1, 2, or 3 is less than 1%; the risk of LNM for Haggitt level 4 pedunculated or sessile polyps is about 12%.[2-4] For a pedunculated lesion of Haggitt level 1, 2, or 3, a complete local excision is adequate for cure. The clinical significance of a Haggitt level 4 sessile or pedunculated polyp is not as clear. If it is determined that a radical operation is warranted on the basis of a 12% risk of LNM, 88% of these operations would be deemed unnecessary.

In 1993, Kudo supplemented Haggitt's classification with regard to sessile lesions[5]: the classification Sm1 denotes a sessile lesion with invasion into the upper third of the submucosa; Sm2 involves invasion into the middle third of the submucosa; and Sm3 involves invasion into the lower third of the submucosa.

The Haggitt classification system and the Kudo classification system can be combined into a single system in which Haggitt levels 1, 2, and 3 correspond to Kudo level Sm1; Haggitt level 4 can be Kudo level Sm1, Sm2, or Sm3 [*see Figure, page 3*].

Nascimbeni and colleagues retrospectively studied the risk of LNM in 353 cases involving T1 sessile lesions of the colon and rectum.[6] They found three independent risk factors: lymphovascular invasion, Sm3 depth of invasion, and location in the lower third of the rectum [*see Table, below*]. Similar findings were found in a series reported by Okabe and coworkers, except that the site in the rectum was significant only in univariate analysis[7]; however, in this series, the three levels of the rectum were not distinguished.

Local excision for malignant sessile polyp or T1 carcinoma of the low rectum

Traditionally, standard criteria have been presumed to confer a low risk of LNM, local recurrence, or both. These criteria include the following: size smaller than 3 cm; a polyp's occupying less than one third of the luminal diameter; full-thickness excision with 1 cm margins; an absence of lymphovascular invasion; and a lack of undifferentiated features. Recently, Komuta and colleagues showed that the commonly used criteria are inadequate.[8] The observer agreement with regard to both lymphovascular invasion and histologic grading was poor, whereas either Haggitt classification and T stage or evaluation of the depth of invasion was more accurate.

After using these criteria to classify patients as being at low risk for LNM,

Independent Risk Factors for Lymph Node Metastasis in T1 Lesions[6]

Factor	Odds Ratio	95% CI	*P*
LVI	3.5	1.4–8.9	0.009
Sm3	5.0	2.3–10.6	< 0.001
Lower third of rectum	6.0	2.2–14.2	< 0.001

CI—confidence interval LVI—lymphovascular invasion

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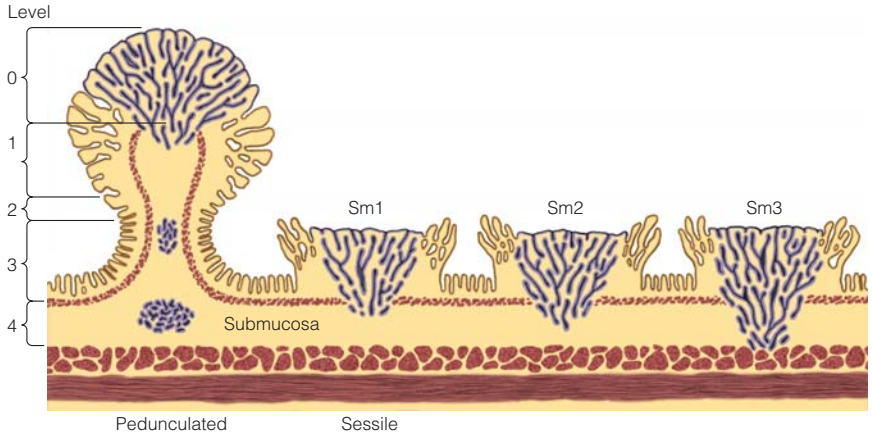

A composite illustration of the depth of invasion in malignant polyps (Haggitt/Kudo classification system). *Pedunculated lesion:* level 0, noninvasive carcinoma; level 1, invasion into the head of pedunculated polyp; level 2, invasion into the neck; level 3, invasion into the stalk; level 4, invasion into the base of the stalk. *Sessile lesion:* Sm 1, invasion into upper third of submucosa; Sm2, invasion into middle third of submucosa; Sm3, invasion into lower third of submucosa.

many institutions have reported consistently high local recurrence rates: Cleveland Clinic, 17% at 55 months' follow-up[9]; Mayo Clinic, 7% at 60 months[10]; Memorial Sloan-Kettering, 14% at 60 months[11]; and University of Minnesota, 18% at 52 months.[12] One can only speculate that the criteria used to select patients for local excision are at fault. Another possibility is that most of these lesions are in the lower third of the rectum and, therefore, are associated with a high risk of lymph node metastasis.[6]

Local excision versus radical resection

Bentrem and colleagues found that radical resection was associated with a better 5-year survival rate and a lower local recurrence rate than was local excision.[13] Nascimbeni and colleagues showed that radical resection for lesions of the mid and lower rectum had better overall and cancer-free survival rates at 5 and 10 years ($P = 0.008$ and 0.003, respectively), as compared with local excision for T1 carcinoma.[10] In this study, there was no significant difference in the rates of local recurrence or distant metastasis ($P = 0.06$ and $P = 0.13$, respectively). However, the study showed that for a T1 lesion in the lower third of the rectum, there was a trend toward better survival, although this trend did not reach statistical significance, owing to small sample size.

Local excision followed by radiation therapy

A series by Benson and coworkers showed that local excision followed by radiation (without chemotherapy) for a T1 lesion of the lower third of the rectum had a high rate of local recurrence at 5 years (39%) and a low rate of disease-free 5-year survival (59%).[14] Other studies have found no benefit to postoperative adjuvant radiation or chemoradiation.[11]

Salvage resection

Waiting to perform a radical resection after a local recurrence is a poor choice. In most series, the success rate has been around a low of 50% at 5-year follow-up.[9,12,13] On the other hand, an immediate radical resection after local excision (within 1 month) was associated with a high 5-year survival rate (79%); this survival rate was not significantly different from that of primary radical resection.[15]

Summary

Local excision of a malignant polyp or a T1 carcinoma of the lower rectum is associated with a high rate of recurrence, using the standard criteria. Radical resection is associated with a better outcome, and many authors now favor radical resection as the primary treatment of malignant polyps of the lower third of the rectum. However, local excision is still suitable for elderly or unfit patients. Local excision followed by radiation is of no benefit; studies of the use of radiation or chemoradiation before local excision have not been reported.

To improve outcomes, better criteria for selecting proper patients for local excision are needed. The Sm system as adopted by the Paris Workshop for carcinoma of the colon may be a better choice.[16] Molecular markers may be the answer in the future.

References

1. Nivatvongs S: Surgical management of malignant colorectal polyps. Surg Clin N Am 82:959, 2002 [PMID 12507202]

2. Haggitt RC, Glotzbach RE, Soffer EE, et al: Prognostic factors in colorectal carcinomas arising in adenomas: implications for lesions removed by endoscopic polypectomy. Gastroenterology 89:328, 1985 [PMID 4007423]

3. Nivatvongs S, Rojanasakul A, Reiman HN, et al: The risk of lymph node metastasis in colorectal polyps with invasive adenocarcinoma. Dis Colon Rectum 34:323, 1991 [PMID 1848810]

4. Kyzer S, Begin LR, Gordon PH, et al: The care of patients with colorectal polyps that contain invasive adenocarcinoma: endoscopic polypectomy or colectomy. Cancer 70:2044, 1992 [PMID 1394034]

5. Kudo S: Endoscopic mucosal resection of flat and depressed types of early colorectal cancer. Endoscopy 25:455, 1993 [PMID 8261988]

6. Nascimbeni R, Burgart LJ, Nivatvongs S, et al: Risk of lymph node metastasis in T1 carcinoma of the colon and rectum. Dis Colon Rectum 45:200, 2002 [PMID 11852333]

7. Okabe S, Shia J, Nash G, et al: Lymph node metastasis in T1 adenocarcinoma of the colon and rectum. J Gastrointest Surg 8:1032, 2004 [PMID 15585391]

8. Konuta K, Batts K, Jessurun J, et al: Interobserver variability in the pathological assessment of malignant colorectal polyps. Br J Surg 91:1479, 2004 [PMID 15386327]

9. Madbouly KM, Remzi FH, Erkek BA, et al: Recurrence after transanal excision of T1 rectal cancer: should we be concerned? Dis Colon Rectum 48:711, 2005 [PMID 15768186]

10. Nascimbeni R, Nivatvongs S, Larson DR, et al: Long-term survival after local excision for T1 carcinoma of the rectum. Dis Colon Rectum 47:1773, 2004 [PMID 15622568]

11. Paty PB, Nash GM, Baron P, et al: Long-term results of local excision for rectal cancer. Ann Surg 236:522, 2002 [PMID 12368681]

12. Mellgren A, Sirivongs P, Rothenberger DA, et al: Is local excision adequate therapy for early rectal cancer? Dis Colon Rectum 43:1064, 2000 [PMID 10950004]

13. Bentrem DJ, Okabe S, Wong WD, et al: T1 adenocarcinoma of the rectum: transanal excision or radical surgery? Ann Surg 242:472, 2005 [PMID 16192807]

14. Benson R, Wong CS, Cummings BJ, et al: Local excision and postoperative radiotherapy for distal rectal cancer. Int J Radiat Onc Biol Phys 50:1309, 2001 [PMID 11483343]

15. Hahnloser D, Wolff BG, Larson DW, et al: Immediate radical resection after local excision of rectal cancer: an oncologic compromise? Dis Colon Rectum 48:429, 2005 [PMID 15747069]

16. The Paris endoscopic classification of superficial neoplastic lesions: esophagus, stomach, and colon. Participants in the Paris Workshop. Gastrointest Endosc 58:S3, 2003 [PMID 14652541]

This Month's Updates

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placed close to the uterus and the cervix. A radical hysterectomy dissects out the lower aspect of the ureters, allowing wider clearance of the central specimen and the adjacent adventitial tissues (e.g., cardinal ligaments and parametria). At an early point in the procedure, the pararectal and paravesical spaces are developed [*see Figure, page 5*]. If the disease appears to be limited to the central specimen, the uterine artery is divided at its point of origin from the superior vesical artery and mobilized over the ureter. The parametria, lying between the pararectal and paravesical spaces, are divided. The ureters are separated from the medial peritoneum of the posterior leaf of the broad ligament, then dissected out to the point where they insert into the bladder. Once the distal ureters have been mobilized, clamps are placed into the paravaginal tissues, and an extra margin of lateral tissue is removed. The rectovaginal septum is also developed to allow division of the uterosacral ligaments closer to their point of origin at the sacrum. The upper 2 cm of the vagina is removed in continuity with the rest of the specimen. A systematic pelvic lymph node dissection is then performed, with skeletonization of the common iliac artery, the external iliac artery, the external iliac vein, and the obturator nerve.

Lynch Syndrome and Endometrial Cancer

Endometrial carcinoma is the most common gynecologic malignancy and accounts for more than 95% of uterine cancers. Although the majority of these carcinomas occur on a sporadic basis, an endometrial cancer can also be the initial manifestation of the Lynch syndrome (hereditary nonpolyposis colorectal cancer [HNPCC]). The lifetime risk of endometrial cancer for women with the Lynch syndrome is 40% to 60%, which equals or exceeds their risk of colorectal cancer.[1]

1. Schmeler KM, Lynch HT, Chen L, et al: Prophylactic surgery to reduce the risk of gynecologic cancers in the Lynch syndrome. N Engl J Med 354:261, 2006 [PMID 16421367]

Intraperitoneal Chemotherapy for Ovarian Epithelial Cancers

Because the majority of patients with ovarian epithelial cancers present with advanced disease, the main goal of surgical intervention is often tumor debulking. The purpose of cytoreduction is to remove the primary cancer, as well as any metastases. If complete resection of metastases is not feasible, the aim is to reduce the bulk of the residual disease to, ideally, a diameter of 1 cm or less (so-called optimal debulking). Optimal cytoreduction enhances the response to I.V. paclitaxel and carboplatinum chemotherapy, and patients with minimal residual disease have a distinct survival advantage over those with more substantial residual disease. Furthermore, current data indicate that patients who have undergone optimal debulking may be candidates for intraperitoneal, as opposed to I.V., chemotherapy. There is evidence to suggest that the use of intraperitoneal chemotherapy may improve survival rates.[1]

1. Armstrong DK, Bundy B, Wenzel L, et al: Intraperitoneal cisplatin and paclitaxel in ovarian cancer. N Engl J Med 354:34, 2006 [PMID 16394300]

1 BASIC SURGICAL AND PERIOPERATIVE CONSIDERATIONS

7 Acute Wound Care

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Wound preparation, wound closure, adjunctive wound treatment, postoperative wound care, factors that may hinder wound healing, and the physiology of wound healing are presented.

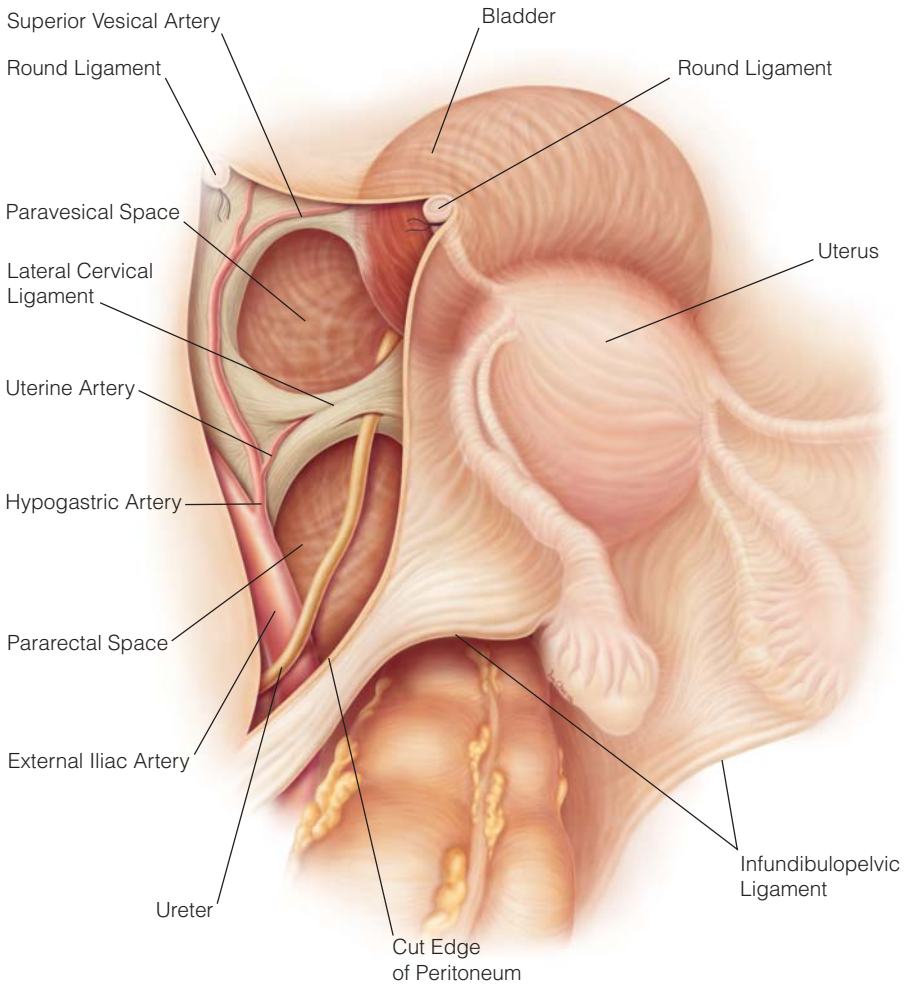
When to Consider Secondary Closure

In secondary closure, the wound is left open and allowed to heal on its own. Secondary closure depends on contraction of the surrounding tissue and epithelialization from the wound margins. When this approach is followed, caution and close observation are essential because the process of tissue contraction can sometimes lead to contracture, a pathologic scar deformity. Secondary closure can, however, yield acceptable results with specific wound types and at specific anatomic sites. With puncture wounds, for example, secondary closure is preferred because it diminishes the likelihood of infection. For both abrasions and puncture wounds, the functional and aesthetic results of secondary closure are generally as good as or better than those obtained by primary or delayed primary closure. For wounds on anatomically concave surfaces (e.g., the medial canthal region, the nasolabial region, or the perineum), secondary wound healing generally yields excellent results. Secondary closure should also be considered for severely contaminated wounds, infected wounds, wounds with significant amounts of devitalized tissue, wounds with foreign bodies, lacerations older than 24 hours, wounds in patients who are in shock, and high-velocity wounds.[1]

1. Leaper DJ, Harding KG: Traumatic and surgical wounds. BMJ 332:532, 2006 [PMID 16513711]

Dressings for Abrasions

Abrasions heal by epithelialization, which is accelerated by the warm, moist environment created by an occlusive dressing. Such an environment not only promotes epithelialization but also enhances healing, both because of the moisture itself and because of the low oxygen tension that promotes the inflammatory phase.[1] A variety of dressings are suitable for treatment of abrasions, including biologic dressings, hydrogels, hydrocolloids, and semipermeable films. These dressings need not be changed as long



Depicted are the retroperitoneal spaces of the pelvis (i.e., the pararectal and paravesical spaces). Dissection of the pararectal and paravesical spaces demonstrates the base of the cardinal ligament separating the two spaces. In this representation, the superior vesical artery has been mobilized from the lateral wall of the bladder and relocated to a lateral position.

as they remain adherent. Small, superficial wounds also heal readily when dressed with impregnated gauze dressings (e.g., Xeroform and Scarlet Red [Kendall, Mansfield, Massachusetts]), which allow exudates to pass through while maintaining a moist wound bed.[1] These less adherent dressings must be changed more regularly.

1. Jones V, Grey JE, Harding KG: Wound dressings. BMJ 332:777, 2006 [PMID 16575081]

Options for Wounds That Are Difficult to Dress

Some wounds are difficult to dress and require special consideration. For wounds with flaps or questionably viable tissue, compression dressings should not be used, because they may cause ischemia. Wounds that cross joints are best dressed with plaster splints for temporary immobilization; semipermeable films are flexible and may also be used in this setting. Wounds with high levels of exudates may be dressed with hydrocolloids, hydrogels, or alginates.[1] For large or irregular wounds, negative-pressure wound therapy (NPWT) with the VAC system (Kinetic Concepts Inc., San Antonio, Texas) is recommended; VAC dressings conform well and remain adherent. Additionally, NPWT uses subatmospheric pressure to remove excess wound fluid, stimulates the formation of granulation tissue, improves peripheral blood flow and tissue oxygenation, and reduces the size of the wound.[2] Use of the VAC system is contraindicated in wounds with exposed blood vessels or bowel.

1. Jones V, Grey JE, Harding KG: Wound dressings. BMJ 332:777, 2006 [PMID 16575081]

2. Enoch S, Grey JE, Harding KG: ABC of wound healing: non-surgical and drug treatments. BMJ 332:900, 2006 [PMID 16613966]

Considerations When Using Topical Antimicrobials

Topical antimicrobials (e.g., antibiotic ointments, iodine preparations, and silver agents) are commonly used to prevent wound infection. Application of mupirocin ointment to a clean surgical wound before placing an occlusive dressing does not reduce the infection rate and may promote antibiotic

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Elements of Contemporary Practice

11 Benchmarking Surgical Outcomes

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8 Fundamentals of Endovascular Surgery

resistance.[1] For uncomplicated traumatic wounds, however, application of bacitracin and neomycin ointment results in a significantly lower infection rate than application of petrolatum. Neomycin-containing ointments reduce bacterial counts in partial-thickness wounds in animals, but many other over-the-counter antibiotic ointments are not effective at reducing bacterial counts in wounds.[2]

1. Dixon AJ, Dixon MP, Dixon JB: Randomized clinical trial of the effect of applying ointment to surgical wounds before occlusive dressing. Br J Surg 93:937, 2006 [PMID 16779878]

2. Davis SC, Cazzaniga AL, Eaglstein WH, et al: Over-the-counter topical antimicrobials: effective treatments? Arch Dermatol Res 297:190, 2005 [PMID 16231147]

The Role of Oxandrolone in Wound Healing

Unlike corticosteroids, anabolic steroids accelerate normal collagen deposition and wound healing. Oxandrolone is an oral anabolic steroid and testosterone analogue that is employed clinically to treat muscle wasting, foster wound healing, and mitigate the catabolism associated with severe burn injury. Supplementation with this agent leads to significant improvements in the wound healing rate. In burn patients treated with oral oxandrolone, hospital length of stay is significantly reduced and the number of necessary operative procedures is decreased.[1] In ventilator-dependent surgical patients receiving oxandrolone, however, the course of mechanical ventilation is longer than in those not treated with oxandrolone. It has been suggested that the very ability of oxandrolone to enhance wound healing may increase collagen deposition and fibrosis in the later stages of ARDS and thereby prolong recovery.[2] Acute elevation of liver enzyme levels has been seen in some patients treated with oxandrolone; accordingly, hepatic transaminase concentrations should be intermittently monitored in all patients treated with this agent.[1]

1. Wolf SE, Edelman LS, Kemalyan N, et al: Effects of oxandrolone on outcome measures in the severely burned: a multicenter prospective randomized double-blind trial. J Burn Care Res 27:131, 2006 [PMID 16566555]

2. Bulger EM, Jurkovich GJ, Farver CL, et al: Oxandrolone does not improve outcome of ventilator dependent surgical patients. Ann Surg 240:472, 2004 [PMID 15319718]

6 VASCULAR SYSTEM

7 Diabetic Foot

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Evaluation and management of the diabetic foot, clinical evaluation, assessment of clinical findings, and management are described.

Be Alert to Arterial Insufficiency

The history of the foot problem can yield valuable insights into the potential for healing, the presence of coexisting infection or arterial occlusive disease, and the need for further treatment. Whenever a patient presents with a foot ulceration or gangrene, possible underlying arterial insufficiency should immediately be suspected, even if neuropathy or infection is present. It is helpful to be aware of the event that incited the foot problem. In a patient with diabetes and arterial insufficiency, the inciting event for a foot ulcer may be a seemingly benign action, such as cutting a toenail, soaking the foot in a warm bath, or applying a heating pad. Unfortunately, because of the broad microneurovascular and macrovascular abnormalities associated with diabetes, these relatively innocuous actions can progress to a nonhealing ulcer and gangrene. Similarly, failure to heal after any podiatric procedure is strongly suggestive of underlying unrecognized arterial insufficiency.

Awareness of Resistant Organisms Critical

Currently, it is clear that resistant organisms, particularly methicillin-resistant *S. aureus* (MRSA), are playing a growing role in the development of skin and soft tissue infections. Traditionally arising in patients who had previously been hospitalized and those who had previously received antibiotic therapy, MRSA-associated infections are now frequently encountered in outpatient settings. Indeed, in many U.S. cities, these so-called community-acquired MRSA infections are the most common skin and soft tissue infections seen in patients presenting to the emergency department.[1] Accordingly, in both outpatient and inpatient settings, it is advisable to assume that MRSA is present in a patient with a diabetic foot infection until the culture data suggest otherwise. Awareness of the increasing prevalence of resistant organisms is critical for current management of diabetic foot infections, especially with respect to the initiation of antibiotic coverage.

1. Moran GJ, Krishnadasan A, Gorwitz RJ, et al: Methicillin-resistant *S. aureus* infections among patients in the emergency department. N Engl J Med 355:666, 2006 [PMID 16914702]

Alerts

⚠ **Biologic prosthesis reduces recurrence after laparoscopic repair of a paraesophageal hernia**

http://www.medscape.com/medline/abstract/16998356?cid=med&src=nlbest

For further information, see **Section 4, Chapter 5 Minimally Invasive Esophageal Procedures.**

Clinical Practice Guidelines

📖 **Guidelines for the pharmacologic and surgical management of obesity**

The American College of Physicians (ACP) has issued guidelines concerning the pharmacologic and surgical management of obesity. The basis of the guidelines is an evidence report developed by the Southern California Evidence-Based Practice Center. The target audience for the guidelines is clinicians caring for obese patients (i.e., those with a body mass index of 30 kg/m^2 or greater). To view the guidelines in their entirety, please click on the following link:

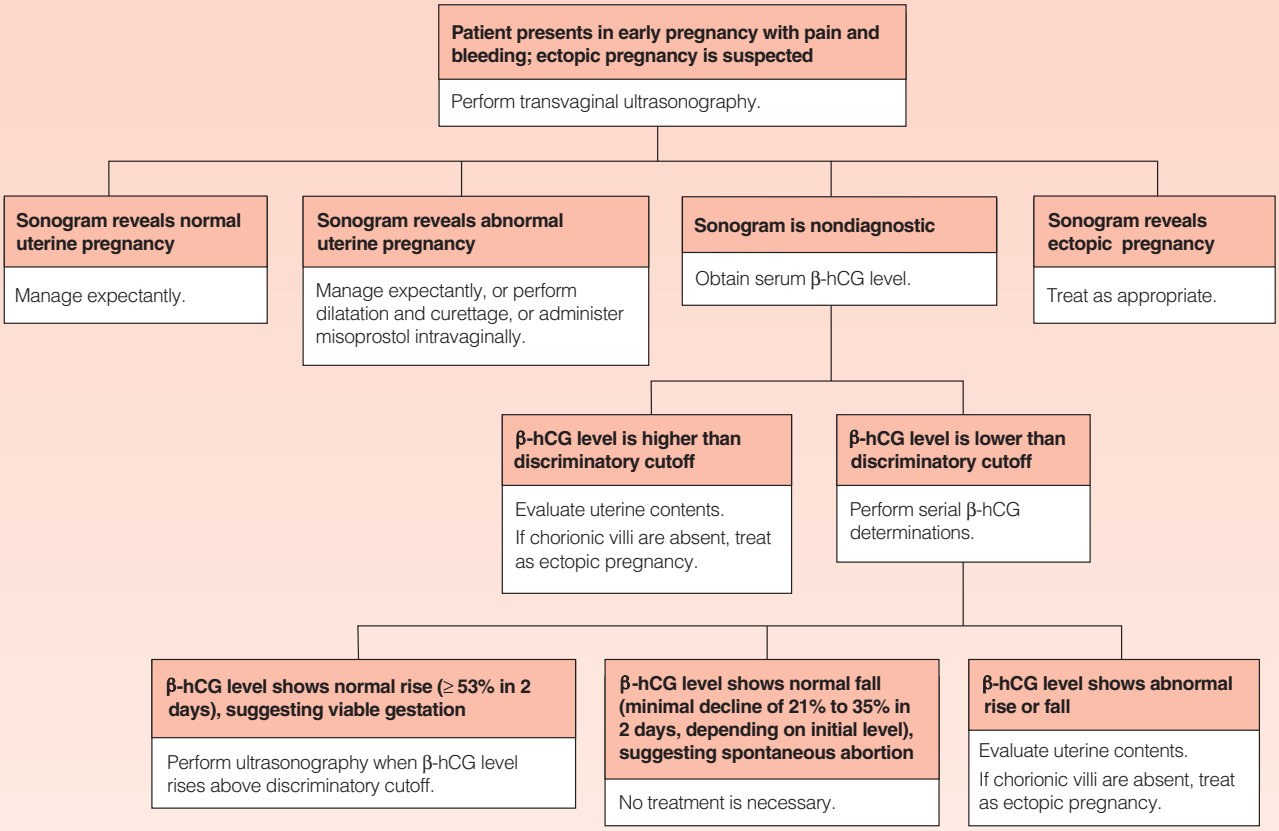
http://www.annals.org/cgi/reprint/142/7/525.pdf

For further information, see **Section 5, Chapters 7 Morbid Obesity** and **19 Bariatric Procedures.**

This Month's Algorithm

Evaluation of Patients with Suspected Ectopic Pregnancy

Pelvic pain and vaginal bleeding in the first trimester are the complaints most commonly associated with ectopic pregnancy. Although hypotension, tachycardia, and guarding may be noted and alert the clinician to impending tubal rupture, most patients present with less alarming findings. Patients with a suspected ectopic pregnancy are initially assessed by means of transvaginal ultrasonography. Given the risk that an ectopic pregnancy may be coexisting with an intrauterine one (estimated to be between 1/4,000 and 1/15,000), the first task in the diagnostic evaluation is to exclude an intrauterine pregnancy.



Approaches to the Treatment of Heel Lesions

Heel lesions in diabetic patients are particularly formidable, and there is considerable confusion regarding how best to manage them. Generally, dry eschars with no evidence of deep infection or abscess may be treated with off-loading alone so as to allow healing beneath the eschar in the fully revascularized foot. In patients with chronic ulceration or osteomyelitis, partial calcanectomy may be considered. The presence of calcaneal osteomyelitis may be determined by means of probing or adjunctive studies such as magnetic resonance imaging. Primary closure is occasionally possible, but given the relatively fixed nature of the heel, either secondary healing or some type of flap coverage is usually indicated. Both local and free flaps may be used in the fully revascularized foot.

Erratum

In Section 3, Chapter 4 Malignant Skin Lesions, Figure 7 has been changed to correct one of the labels: The structure known as nodal tissue *is now correctly labeled.*