Strategies in Gynecologic Surgery

Edited by
Herbert J. Buchsbaum
Leslie A. Walton

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With 82 Illustrations

Editors

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Preface

This volume is directed toward physicians who perform gynecologic surgery. The problems addressed are those encountered specifically in the performance of surgical procedures on the female genitalia. This book is not intended to be an atlas of surgery, but rather to supplement the many atlases available to the interested reader.

There is an increasing body of physiologic and clinical data that is directly related to gynecologic surgery. The editors have selected subjects for this volume that directly impact on the outcome of the operative procedure. Authors were chosen who have documented interest and expertise.

Many decisions made before the performance of the gynecologic operation can influence the outcome of the procedure, such as choice of abdominal incision, preparation of the operative field, and use of prophylactic anticoagulants and antibiotics. During the operation, additional choices that are open to the surgeon can affect the outcome: choice of suture material, technique of bladder drainage, and the use of drains. Attention to details of surgery, avoidance of genitourinary or gastrointestinal injury, and attention to potential problems in specific age groups can result in better outcome for the patient. The reader will also find chapters devoted to the legal implications of operative consent, the control of surgical bleeding, and intra- and postoperative monitoring.

It is our hope that the material in this book will help the gynecologic surgeon in his practice to improve the care of the female patient undergoing operative procedures on the genitalia.

We wish to thank our administrative assistants for their valuable contributions: Joyce Perry at the University of Pittsburgh, and Jackie Rogers and Dorcas Austin at the University of North Carolina. Their help was invaluable in coordinating the many aspects of manuscript preparation and editing. We would also like to acknowledge the efforts of Susan A. Kreml, Copy Editor, and the capable staff of Springer-Verlag.

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Preoperative Assessment 1

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The Approach to the Patient

The gynecologist must utilize all available information in the delivery of surgical care to the patients. The advances in knowledge relevant to patient care, the increased availability of sophisticated technology, the heightened awareness of patients to diseases, and the continued refining of the physician–patient dialogue are among the factors that enhance the quality of care and contribute to the well-being of the patient.

The gynecologic surgeon is confronted by an array of challenging problems as he/she cares for the patients and aims for a successful outcome. The preoperative evaluation delves into the medical, surgical, social, and psychologic problems in an attempt to identify critical factors that might compromise the patient's hospital stay. This stay can be brief if the procedure is performed on an outpatient basis, or prolonged if an in-hospital stay is warranted. The patient involved can be young, healthy, and resilient, or older and burdened by diseases of aging. Whatever the patient's age, careful attention to all details is important as the patient approaches an operative procedure.

The increasing role of the federal government and third-party payers in health care costs has created a shift from in-hospital to outpatient care. In addition, there is an ongoing assessment of the need for many of the diagnostic studies that were routinely obtained in the past. Despite the increased emphasis on

cost containment with curtailing of testing, the expectation of a good outcome from any surgical experience is still to be anticipated, and the delivery of medical care has been refined so that good outcomes are the rule rather than the exception. Thus, the preoperative evaluation of the patient is important in the total delivery of care of the surgical patient.

Finally, the most critical factor of the preoperative assessment is the patient herself. Operations on the female genital tract impinge heavily on the patient's psychosexual function. Whether the surgical procedures are for irregular bleeding, pelvic infection, or relaxation of pelvic structures, thoughts about sterility, cosmesis, and sexual function swirl in the patient's mind. These thoughts need to be addressed. It is important, for example, that we pay attention to the older patient's sexuality. Cognizance of these concerns and other problems play an important role in the preoperative period.

History and Physical Examination

Many significant details of the patient's history may be familiar to the physician because of prior outpatient care and treatment. These details should be reviewed and verified during a comprehensive preoperative history and physical examination. All facets of the chief complaint should be reviewed and attention directed to other organ systems. Since gyne-

cologists are now caring for an older population, the patient's history must emphasize a careful organ system review to look for cardiac, renal, or pulmonary disease. For example, a history of prolonged uterine bleeding alerts the surgeon to the deleterious effects of anemia on cardiac function and cardiac reserve, tissue healing, and response to stress. Endocrine abnormalities such as diabetes mellitus and gastrointestinal diseases such as diverticular disease are common among older women. A drug history is important in a search for allergic reactions. In addition, knowledge of drug dosage will alert the physician to look for side effects.

A history of multiple operations or repeat pelvic infections would alert the surgeon to the possibility of bowel adhesions and allow him to prepare the bowel preoperatively. Finally, bone and joint disease such as osteoporosis and arthritis may become important in positioning of the patient, planning for cushioning of joints if stirrups are used, and planning of postoperative activity of the patient. The existence of previously performed diagnostic studies is also important. These studies might alert the physician as to the need for further diagnostic studies or may assist him in assessing the severity of preexisting medical conditions.

Thus, a thorough assessment of the patient's health and disease status will enable the physician to provide total and comprehensive care. The process of obtaining a pertinent history will enhance the patient's confidence in her physician, and she may be comforted as she approaches the operating room setting.

Careful physical examination is mandatory in search of new findings that might indicate worsening of the patient's disease condition. It can never be assumed that previous physical findings have remained unchanged. An ovarian cyst diagnosed in the office could have ruptured and not be present at the in-hospital examination. Similarly, the presence of a 6-cm cystic mass in a patient now complaining of abdominal pain could indicate that the cyst has undergone torsion. In addition, a new and unrelated condition could have developed in the intervening days. As an example, the older patient with the diagnosis of bilateral adnexal masses could have developed a third abdominal-pelvic mass and have diverticular abscesses rather than tuboovarian abscesses. Careful attention to symptoms of the lower gastrointestinal tract would be helpful in the latter example.

The physical examination should be performed with keen emphasis on factors that will impinge on the patients's response to the surgical procedure. Weight and blood pressure are important. Complete examination of the head and neck might identify conditions that can complicate the operative process. A goiter or tracheal deviation could make endotracheal intubation difficult. Large, pendulous breasts would aggravate ventilation by mask and would compromise full diaphragmatic expansion postoperatively. Cardiac irregularities or murmurs require evaluation and, occasionally, the administration of prophylactic antibiotics.

The physical examination should look for deformities that might complicate the proper positioning of the patient. Careful evaluation of the extremities is necessary: for example, venous thromboses, may modify the intraoperative and postoperative care of the patient.

Abdominal and pelvic examinations are critical in the patient's evaluation. The working diagnosis must be confirmed. A detailed description of the pelvic findings should be carefully recorded. An examination under anesthesia should precede the surgical procedure for educational and diagnostic reasons.

A thorough and complete examination enables the physician to assess whether surgery is the appropriate method of treatment. In addition, a thorough evaluation sustains the patient's confidence and prepares her psychologically for surgery.

PREOPERATIVE TROUBLESHOOTING IN THE GYNECOLOGIC PATIENT

The dynamic approach to the patient about to undergo surgery requires that certain baseline questions be answered. Does the patient require further diagnostic tests? Does the present illness mimic a nonsurgical disease? Is this the appropriate time for a surgical intervention or would temporization and medical care relieve her suffering or improve her response to surgery? Are there therapeutic measures that can be instituted that would enhance the response to surgery and the recuperation

period? Is this a patient whose surgery could be delayed to obtain autologous rather than homologous blood should intraoperative transfusion become necessary? Is the patient about to be subjected to too many risks because of the operative procedure? Is the patient's psychologic support system geared toward a positive outcome to the operative procedure and the postoperative period?

The Assignment of Surgical Risk

The assignment of surgical risk is an important preoperative consideration. The classification outlined below has been in use for some time to assess the risk of mortality from surgical procedures and is known as the American Society of Anesthesiology (ASA) Physical Status Classification[1] (Table 1-1.). All preoperative patients should be assigned to one of the five categories.

It is obvious that anesthesia and surgical morbidity worsen as the physical status traverses from status I to status V.

THE CARDIOVASCULAR SYSTEM

The absence of cardiac symptoms, confirmed by studies, is one indicator for a satisfactory recovery from the surgical procedure. However, normal physiologic and metabolic responses occur as a result of an operative approach, and if these responses are exaggerated, intraoperative and postoperative cardiac problems can develop.

In the perioperative period, it has been clearly shown that patients have an increased sympathetic activity as evidenced by an increased urinary output of catecholamines. In addition, increased levels of adrenocorticotrophic hormone (ACTH) and its accompanying stimulation of glucocorticoids and aldosterone result in elevation of these hormones. Antidiuretic hormone (ADH) levels also increase. Some patients will exhibit mild elevation of blood pressure, hyperglycemia, and fluid retention as a result.[2] While these alterations may not create major variations from normal baseline values, they can lead to systemic changes if aggravated.

All anesthetic agents depress myocardial function,[3] including halothane and nitrous ox-

Table 1-1. ASA Physical Status Scale[a]

Physical status	Patient category
I	A normal healthy patient.
II	A patient with mild-to-moderate systemic disease, e.g., anemia, morbid obesity.
III	A patient with severe systemic disease that limits activity not to the point of incapacitation, e.g., healed myocardial infarction, diabetes mellitus.
IV	A patient with incapacitating systemic disease that is life threatening, e.g., renal insufficiency.
V	A moribund patient who is not expected to survive, e.g., a patient with massive pulmonary embolus.

[a] From Owens et al. (1).

ide, anesthetics that are frequently used. Sodium pentothal, used for induction of anesthesia, also depresses myocardial contractility. As a result there is a reduction in venous return, and the available intravascular volume diminishes. The decreased myocardial contractility can lead to a significant diminution in cardiac output with resultant hypotension if not compensated by reflex tachycardia. The young, healthy patient with no cardiac disease can easily compensate for these changes with reflex tachycardia, while the older patient may experience a decrease in coronary perfusion and suffer from myocardial ischemia and other sequelae.

A number of older patients have some degree of myocardial fibrosis. Positive-pressure anesthesia results in an elevation of the intrathoracic pressure and a reduction in venous return and cardiac output. Since significant degrees of hypoxemia are often seen following surgery, this fall in oxygen tension and a decreased cardiac output might compound any preexisting cardiac disease and create organ system compromise in the postoperative period. Whenever a preoperative patient exhibits signs of hemodynamic instability, consideration should be given to the use of Swan–Ganz catheter monitoring.

Cardiac Risks. In 1977, Goldman and associates[4] published a large study in which they ex-

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Table 1-2. Cardiac Risk Factors

Risk factor	Points (no.)
1. Age greater than 70 years	5
2. Myocardial infarction in previous 6 months	10
3. S3 gallop or jugular venous distension	11
4. Important aortic stenosis	3
5. Rhythm other than sinus or premature atrial contraction	7
6. More than five premature ventricular contractions per minute documented any time prior to surgery	7
7. Poor general medical condition, e.g., elevated BUN, bedridden patient	3
8. Intrathoracic, intraperitoneal, or aortic operation	3
9. Emergency operation	4

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amined cardiac risk factors involving 1001 patients over 40 years of age who were subjected to major, noncardiac operations. These authors evaluated the role of nine independent correlates and the role of these correlates in predicting life-threatening complications. These correlates were assigned a point value according to their relative importance (Table 1-2).

As one computes the patient's totals, four risk categories were defined (Table 1-3). Serious cardiac morbidity is directly proportional to class.

According to the Goldman classification, therefore, any patient with a risk index of 26 or more points should undergo surgery only if it is a life-saving procedure. Patients with index

Table 1-3. Class and Morbidity

Class	Points (no.)	Percentage of cardiac deaths or life-threatening complications
I	0–5	0.9
II	6–12	7.0
III	13–25	14.0
IV	>26	78.0

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scores of 13–25 (class III) probably have sufficient cardiac risks to warrant routine preoperative medical consultation.[4]

Other categories of patients with cardiac disease need to be considered. Patients with stable angina pectoris who have not had a previous myocardial infarction do not appear to be at significantly increased risk when an elective surgical procedure is performed. Patients with unstable angina of less than 3 months duration constitute an absolute contraindication to noncardiac surgery except in emergency situations. Patients with documented coronary artery disease[5] constitute a special group and should be considered for cardiac bypass operation prior to major, noncardiac surgery. In addition, patients with fixed cardiac output as a result of diseases such as tight aortic or mitral stenosis are at increased risk. They require cardiac consultation prior to surgery.

Patients with myocardial infarction pose a special problem. The Mayo Clinic studies[6] showed that 6.6% of patients with a previous myocardial infarction and only 0.13% of patients without a previous infarction suffered a second infarction in the postoperative period. Advances in anesthesia did not change this morbidity rate when this study was repeated 6 years later.[7] The re-infarction rate was higher for upper abdominal and thoracic procedures. The risks of re-infarction increase dramatically if surgery is performed within the first 6 months after an acute myocardial infarction. Thus, elective surgery should always be postponed for at least 6 months following either a transmural or nontransmural myocardial infarction.[4,6]

Patients with "compensated" cardiac function following treatment for congestive heart failure are not at increased risk in noncardiac surgery. Patients with uncompensated congestive heart failure, especially patients with an S3 or jugular venous distension, are at risk for additional cardiac problems and more specifically pulmonary edema.[8] If a patient has more than five premature ventricular contractions per minute at any time prior to the surgical procedure, she is at increased cardiac risk. Intraoperative therapy with lidocaine is indicated, but it is not known whether administration of this drug decreases cardiac complications. The patient with atrial fibrilla-

tion does not seem to be at increased risk if cardiac rate is adequately controlled before surgery.[8] Conduction system disease such as third-degree A-V block, type I or II A-V block, and sinoatrial block are among the cardiac irregularities that require a temporary pacemaker prior to elective surgery.[9,10] Patients with unstable angina also require a temporary pacemaker prior to surgery.

Prophylaxis against Endocarditis. Transient bacteremia is a common phenomenon. While a higher incidence occurs in nongynecologic conditions, transient bacteremia occurs after urethral catheterization, sigmoidoscopy, and pelvic infections. Prophylactic antibiotic therapy is indicated in patients very susceptible to bacteremia. The cardiac lesions[11,12] that merit prophylactic antibiotics are listed in Table 1-4.

The Role of Hypertension. During intubation, the systolic blood pressure can be elevated by 20–45 mm Hg. This elevation occurs in 6% of normotensive patients and in 17% of patients with a history of hypertension.[8] Provided that there are no sequelae from this elevation, no further complications should arise.

Mild-to-moderate hypertension does not increase the morbidity from elective surgery.[13] Patients with elevated blood pressure prior to surgery have a high incidence of intraoperative *decrease* in blood pressure, but there is no increased incidence of cardiac complications. Patients with stable diastolic pressures up to 110 mm Hg can undergo surgery but require close intraoperative and recovery room monitoring. If hypertension is uncontrolled, however, elective surgery is contraindicated.

Antihypertensives and Other Cardiovascular Medications Prior to Surgery. The standard dictum has been to discontinue antihypertensive medications before surgery so as to decrease the risk of intraoperative hypotension.

Patients with mild hypertension can discontinue their medication prior to elective surgery. The enforced bed rest of hospitalization contributes to normal pressure readings. However, most hypertensive patients will require the continuation of their medication. Some authors[13] recommend drug dose reduction. Other authors[14] recommend that antihypertensive drugs should be continued in full dosage until the night preceding surgery and be restarted in the immediate postoperative period. The anesthesiologist should be aware of the patient's medication.

Comments about a few drugs are in order. Clonidine hydrochloride should not be discontinued, because the abrupt cessation of the drug leads to severe rebound hypertension. Clonidine may cause hypotension because of the additive effect of anesthesia. Once the anesthesiologist is aware of this complication, careful intraoperative monitoring can be instituted. Propanolol should be continued pre- and postoperatively. Digitalis does not significantly increase the cardiac risks and can be continued, although bradyarrhythmias are more frequent in patients who are digitalized after hospital admission. This finding probably signifies an unstable digitalis level.[9] Nitroglycerine compounds should be continued during and after surgery.

THE RESPIRATORY SYSTEM

The young gynecologic patient may have asymptomatic pulmonary disease that will become manifest with routine preoperative evaluation. The older patient can be more symptomatic, and a detailed and orderly review of pulmonary function is warranted.

The vital capacity can be decreased by as much as 45% for several days postoperatively in patients undergoing surgical procedures on the thorax and upper abdomen.[15] This decrease is less in pelvic procedures. In addition, residual volume and functional residual capacity are among the lung volume decreased by general anesthesia.

Hypoxemia occurs after surgery. The mean Pa_{O_2} drops from 88 preoperatively to 63 immediately after surgery.[15,16] This fall is caused primarily by small airway collapse intraoperatively and postoperatively. Shunting and V–Q mismatch is a sequelae.

Table 1-4. Cardiac Conditions Requiring Prophylactic Antibiotics

Prosthetic valves of all types
Acquired valvular lesions
Congenital cardiac lesions
Mitral valve prolapse

A history of asthma, exposure to environmental pollutants, or illnesses such as sarcoidosis may predispose the patient to postoperative problems such as atelectasis and bronchitis. The incidence of these latter two conditions is about 10%–20% in the normal healthy postoperative patient. It is decreased to the 10% range in patients undergoing lower abdominal surgery.[17] Chronic smoking predisposes the patient to these complications and further sequelae such as pneumonia.

An awareness of medications being ingested for pulmonary disease is important. One of the common classes of asthmatic medication, the adrenergic drugs, cause vasoconstriction, cardiac stimulation, and bronchodilatation. Another class of drugs, the glucocorticoids, have no direct vascular effects, but affect the stress response, tissue healing, and fluid and electrolyte balance.

Many factors place the patient at risk for pulmonary complications:

a. Smoking, especially chronic
b. Obesity, especially morbid obesity
c. Known pulmonary disease
d. Age of the patient (over 70 years)

In addition, patients with an inability to complete a graded exercise test and patients with heavy sputum production (greater than 30 ml/day) are at risk for postoperative complications.

Simple assessment tests for respiratory function include arterial blood gases and pulmonary function testing (PFT). Preoperative PFT is indicated in the patients at risk for pulmonary complications. Preoperative arterial Pa_{O_2} less than 50 mm Hg[15] and/or Pa_{CO_2} greater than 15 mm Hg are significant contraindications to pelvic surgery.

The patient's pulmonary status can be optimized by such measures as cessation of smoking, weight reduction, and the use of incentive spirometry. Bronchodilators and chest physiotherapy for a few days preoperatively have been shown to increase the Pa_{O_2}. In one study,[16] patients given preoperative and postoperative intensive pulmonary therapy had a 22% incidence of pulmonary complications, while those not receiving treatment had a 60% incidence of pulmonary complications.

The patient with pulmonary diseases needs special attention. Acute asthmatic bronchitis affects approximately 25 million Americans.[18] Many patients might be relatively asymptomatic or might present with symptoms of dyspnea, chest tightness, and/or a chronic cough. When symptomatic, tachypnea and wheezing are the classic symptoms. If asthma or equivalent disease is suspected or diagnosed, blood gas determination and pulmonary function studies are indicated. A useful study is the measurement of the forced expiratory volume (FEV). If this value is less than 75% of predicted value, surgery can proceed with the use of general anesthesia. If the patient has moderate or severe symptoms, FEV changes more than 75% of predicted value,[19] and abnormal P_{O_2} and P_{CO_2} values, intensive evaluation and treatment prior to surgery is recommended.

It is important that bronchial irritants such as smoking be removed, that the patient is well hydrated to allow expectoration of secretions, and that premedication avoid drugs such as codeine, morphine, and cholinergic agonists. Quiescent asthma can flare up during general anesthesia and require the administration of intravenous theophylline.

The patient with chronic obstructive pulmonary disease deserves special attention. An established preoperative routine should be utilized to reduce the incidence of postoperative complications. The presence of purulent sputum indicates the need for a course of antibiotics in addition to the therapy outlined above.

THE HEMATOLOGIC SYSTEM

Hemorrhage is a major risk for the patient undergoing surgery. A hematocrit in the 30% range or a hemoglobin level of 10 g/dl is required prior to elective gynecologic surgery. The requirement can be ignored when dealing with patients with sickle-cell disease, chronic renal disease, and other such conditions. A 30% hematocrit value does not allow a great margin of safety. In the young anemic healthy patient, it is advisable that pelvic surgery be postponed, if feasible, while the patient is offered iron, vitamins, and folic acid to facilitate the production of red blood cells. If the nature of her disease contradicts postponement of the operative procedure, transfusion with packed red cells is preferable to whole blood in order to reduce the problems associated with volume

expansion. Washing of the red cells reduces the possibility of transfusion reactions. One unit of red cells has an average hematocrit in the range of 70%–80% and will raise an adult's hematocrit by about 3 volumes percent.

On the other end of the spectrum, patients with hematocrit values as high as 57%, as in polycythemia vera, are at increased risk for hemorrhagic and thrombotic complications.[20] These patients have a surgical mortality rate approaching 36%. Elective surgery should be deferred until therapy reduces the hematocrit to the 42%–47% range and the platelet count to less than 500,000/mm³.

Compromise of platelet function can be diagnosed preoperatively. Aspirin increases the bleeding complications because it inhibits platelet function with resultant prolongation of the bleeding time. This inhibition can occur for up to 10 days after aspirin ingestion. This bleeding problem is worsened when low-dose heparin is given concomitantly. Carbenicillin and ticarcillin inhibit platelet function and create a prolongation of the bleeding time. The effect can last for several days after the drugs are discontinued. Malnutrition and bowel sterilization reduce vitamin K levels and create clotting deficiencies. Indomethacin and phenylbutazone also inhibit platelet release but only for a short period of time. Antihistamines, dopamine, doptamine, and the nonsteroidal antiinflammatory drugs also inhibit platelet function.

Functional platelet disorders are rare. Von Willebrand's disease, Bernard Soulier's syndrome, and thrombasthenia create abnormal bleeding time. These patients have a history of easy bruisability and a history of bleeding problems during prior surgical procedures. The platelet count is usually normal. Prothrombin time and partial thromboplastin time (PTT) will be normal in these conditions. Uremia creates bleeding by depression of platelet function.

While decreased platelet counts exposes the patient to increased risk of bleeding, only counts below 15,000–20,000/mm³ may require prophylactic platelet transfusion. However, prolongation of bleeding should alert the physician to study clotting factors. Usually, patients with a platelet count above 100,000 are not at increased risk for bleeding unless the operation results in excessive blood loss and a consumptive coagulapathy. Although preoperative coagulation profiles are routinely ordered, there is little data to substantiate the need for these tests in the absence of a positive history, or drug ingestion.

THE URINARY TRACT SYSTEM

The routine gynecologic patient presents with few renal problems. If symptoms are present, pressure or obstruction needs to be considered. Routine urinalysis is indicated.

During anesthesia, renal blood flow and glomerular filtration is reduced, resulting in decreased urine output. Age, renal disease, nephrotoxic medications, and peritonitis jeopardize renal status. A rough measure of renal function is obtained by the determination of creatinine clearance using the Cockroft–Gault formula.[21] The formula is as follows:

$$Cr + (140 - age) \times kg/72 \times creat (mg/dl)$$

It is age dependent and applicable to adult males. The creatinine clearance for women is 85% that of the male value. The creatinine clearance is valuable when measurements are made with stable renal function and a stable serum creatinine. (See Chapter 10.)

One of the basic radiologic studies utilized by the gynecologist is intravenous pyelography (IVP). This study will usually alert the physician as to the existence of anatomic distortions or anomalies of the tract or intrinsic renal disease. Knowledge of the BUN and creatinine is important before an IVP is ordered. Older patients, diabetics, patients who are dehydrated, or patients with intrinsic renal disease can develop renal insufficiency after dye studies such as intravenous pyelography.[22] Intravenous pyelogram can safely be performed if the serum creatinine is 2 mg/dl or less. When intravenous pyelogram is contraindicated, noninvasive renal ultrasound is a useful substitute.

The presence of chronic anemia could be the result of chronic renal disease. Patients with uremia have platelet dysfunction, which could result in a prolonged bleeding time during surgery. In addition, the presence of a chronic low hematocrit would predispose the patient to poor healing and cardiac dysfunction. Accordingly, it is desirable to have the

hematocrit corrected to an acceptable level before general anesthesia is administered.

The toxic effects of drugs on the bladder and kidney must be kept in mind. Gentamicin is known for its renal toxicity. This drug can create elevation of the BUN and creatinine after at least 2–3 days of administration. Adequate drug history will alert the physician to seek for any renal deficiency.

Patients with mild renal failure (serum creatinine less than 3 mg/dl) generally tolerate surgery very well.

ENDOCRINE CONSIDERATIONS

Diabetes mellitus is encountered in the older gynecologic population. In addition to the difficulties of hypo-hyperglycemia and ketoacidosis, suboptimal control of the diabetic patient will result in persistent glycosuria. If patients have an accompanying osmotic diuresis, changes in electrolytes would occur. In addition, diabetic patients are at increased risk for postoperative infections, usually with a gram-negative organism. Accordingly, tighter control of diabetes is necessary to prevent electrolyte disturbances. In addition, better control enhances wound healing and lessen the chance of postoperative infection.

The diabetic patient might require hospitalization prior to surgery so that a battery of tests can be performed. The surgical procedure should be performed early in the morning. When insulin administration is necessary, a suggested protocol is as follows:

Minor surgery—withhold insulin until after the procedure

Major surgery—administer ⅓ of total daily regular insulin dose preoperatively and ⅓ postoperatively

The outpouring of catecholamines and corticosteroids secondary to surgical stress will accentuate the hyperglycemia. In addition, two commonly used anesthetics, halothane and ether, both cause hyperglycemia. Blood sugar determinations can be obtained intraoperatively to assist in the management of the patient. Urine glucose measurements are useful only if renal glucose threshold coincides with plasma glucose.

Adrenal insufficiency is rare in the gynecologic patient. However, relative adrenal insufficiency secondary to exogenous steroid administration can occur; inhaled steroids or a 7-day course of oral steroids can depress adrenal function for several days.[23] These patients are unable to mount an adrenocortical outpouring under the stress of surgery. Replacement therapy for adrenal insufficiency is necessary. One replacement protocol uses hydrocortisone sodium succinate as follows:

50 mg I.M. ½ hr preoperatively
15 mg/hr I.V. intraoperatively
10 mg/hr I.V. postoperatively
Postoperative days 1–2, 50–100 mg I.V./8 hr
Postoperative days 3–4, 50 mg IM q. 12 hr
Postoperative days 5–7, hydrocortisone 30 mg orally at 0700 hr and 20 mg orally at 1400 hr

In addition, occasionally patients are seen who are on steroid therapy for collagen or other disease conditions. Steroids are known to interfere with wound healing and suppress the immune response. Prednisone at a dose of 7.5 mg/day for at least 5 days can lead to adrenal suppression. These patients also require steroid supplementation at the time of surgery.

The duration of replacement therapy will depend on the extent of adrenal suppression and the extent of the surgical procedure. A brief surgical procedure with minimal adrenal challenge will allow the termination of steroids immediately after surgery.

Adrenal excess, that is, pheochromocytoma is always considered but rarely if ever seen. If symptoms of this disease are found, appropriate diagnostic studies are indicated and elective surgery is absolutely contraindicated.

THE GASTROINTESTINAL TRACT

Gynecologic conditions may upset the functioning of the gastrointestinal tract as a result of direct pressure or involvement of the adjacent bowel or as a result of a generalized process in which the gastrointestinal tract is one of a multi-organ-system involvement. While the incidence of direct gastrointestinal involvement by benign pelvic diseases is low, the incidence of gastrointestinal symptoms is high.

In the preoperative evaluation, a history of gastrointestinal symptoms is important. Vomiting should alert the physician to assess serum

electrolyte levels. In addition, fluid replacement needs to be considered if vomiting and dehydration have created a contracted intravascular volume.

Changes in intestinal motility can create abdominal distension, and interfere with diaphragmatic excursion. Preoperative bowel decompression via long tube is sometimes necessary. In addition, emptying the colon via enemas enhances pelvic exposure, lessens the chance of bowel injury and subsequent contamination, and hastens bowel recovery after pelvic operations.

In the absence of intestinal involvement by pelvic disease, bowel symptoms are important if they point to primary diseases of the gastrointestinal tract. In addition, it is important that a dietary history be obtained from the patient as one measure of nutritional status.

General Considerations

The presurgical anesthesia visit is important to establish the doctor–patient relationship. The patient is able to meet one of the major members of her surgical team, and can acquire an understanding of the process that will enable her to tolerate the surgical procedure. A review of her suitability for anesthesia is another rung in the support system.

Body surface preparation of the gynecologic patient is important. Established routines are followed for the abdominal and vaginal preparation (see Chapter 4). Select patients may benefit from prophylactic antibiotics at the time of abdominal and vaginal hysterectomy (see Chapter 8). The use of support stockings properly applied before surgery is important. Numerous approaches are used to reduce or prevent thromboembolic phenomenon (see Chapter 11). These are some of the many considerations to be reviewed in the preoperative phase.

Fluid and Electrolye Considerations. Vomiting and diarrhea in the gynecologic patient can result in deficiency in serum electrolyte content. Of major importance are the serum levels of potassium and sodium. Correction of hypokalemia is mandatory prior to surgery. Hypokalemia can interfere with cardiac and renal

function, aggravate effects of anesthesia, and create acid–base imbalance.

Gynecologic patients also experience relative clinical dehydration, especially patients under care for sepsis and patients whose overall oral fluid intake is restricted. Occasionally, the restriction of fluid and the bowel preparation necessary for diagnostic tests such as intravenous pyelography (IVP) and barium enema (BE) contribute to relative intravascular volume depletion. This volume must be replaced prior to surgery.

Nutritional Considerations. A satisfactory nutritional condition fortifies the patient's immune status, helps resist opportunistic infection, and enhances wound repair. Bistrian et al.[24] reported that at least half of the patients on both public and private wards are in some state of protein-caloric deprivation. The obvious nutritionally deficient patient will present with weight loss, muscle atrophy, poor skin turgor, and an inappropriate complexion. However, most patients on the gynecologic service would not exhibit such obvious signs of malnutrition.

The assessment of nutritional status can be made briefly by physical measurements and blood studies. Height and weight are not reliable indicators of nutritional deficiencies. The amount of body fat can be measured by using the Lange caliper and measuring the nondominant midarm triceps skin-fold thickness[25] and then comparing this result with published standards. Muscle mass[25] can be measured by the use of the nondominant midarm circumference. This value is subtracted from the triceps skin-fold thickness and the result multiplied by 0.314. This figure is then checked for deviation from standard sources. Values greater than 90% of predicted values are within the normal range.

Finally, clinical studies can be used to screen for undernutrition. A serum albumin concentration less than 3.4 g/dl indicates some degree of malnutrition, if obvious liver and renal diseases are excluded. Similarly, reduced serum transferrin value indicates that malnutrition is present. Transferrin levels between 170 and 180 mg/dl have been associated with major operative complications.[26] A total lymphocyte count of less than 1,500/mm³ indicates protein