CHAPTER 18

SURGERY

MEDICAL CARE OF THE SURGICAL PATIENT

Preoperative assessment of the patient

For achieving the desired optimum results in a surgical patient, apart from evaluating the nature and extent of the diseases and choice of surgery from available options, the assessment of the patient for his ability to withstand the stress of surgery and anaesthesia is very important. The factors that must be considered in preoperative assessment are:

(i) The disease (and its extent) for which the surgery is planned.
(ii) The condition of the patient and his organ systems.
(iii) The relative urgency of the surgery.
(iv) The type of surgery and its alternatives.
(v) The relative morbidity and mortality of the disease.
(vi) The relative morbidity and mortality of the surgical procedure.

All these factors are interdependent and this assessment is the most fundamental task to be performed in a surgical patient. The best person to undertake this task is the surgeon himself. Surgeon may, at times, need the help of a physician, cardiologist or anaesthetist, to take the right decision. The preoperative assessment should also include discussion on drugs being taken by the patient and documentation of known allergies.

Informed consent

Informed consent should be taken after a detailed discussion by the surgeon (or his responsible assistant) with the patient and his close relatives, informing them about the nature of the procedure planned, benefits expected, risks involved and possible alternatives, giving full opportunity to them to ask questions and clear doubts.

Preoperative preparation

- Routine investigations Hb, TLC, DLC, CT, BT, urine routine examination, and in patients over 30 years, chest X-ray and ECG.
- Special and specific investigations depending upon the nature of the procedure planned and the physical condition of the patient for evaluating fitness for surgery.
- Lipstick, nail polish and other cosmetics, which may mask cyanosis and interfere with pulse oximetry, should be removed.

- Dentures, spectacles, contact lenses, artificial limbs, artificial eyes, hearing aid and jewellery, cash and mobile phones should be removed before shifting the patient to operation theatre.
- Withholding feeds before surgery depending upon age of the patient and nature of anaesthesia and surgery planned.
- Bathing, if possible, patient should take a proper bath on the day prior and on the morning of surgery giving special attention to the operative area. Patient should wear only clean hospital clothing.
- Hair removal should be done as close to the time of surgery as possible. If the skin is to be shaved, it is best done immediately before surgery. These are best removed with a clipper or chemical depilator. Shaving results in damage to skin and leads to abrasions that may not be visible.
- One should ask for history of allergic reactions to any chemical solutions.
- While scrubbing, one should work away from the operative site. Visibly soiled skin should be washed with soap and water before using surgical scrub.
- Pre-anaesthesia medication as per policy.

Skin preparation for surgery

Preoperative surgical antisepsis aims at blocking infection into surgical wound and consists of hand washing, gloving along with application of antiseptic to surgical site.

Any of the following surgical scrubs can be used for skin preparation:

Povidone iodine. It acts by oxidation/substitution of free iodine. Povidone iodine is used as a surgical scrub after combining with a detergent. It is effective against Gram-positive bacteria but weaker against other microorganisms. It has a residual activity and is active in presence of organic substance. It is absorbed through skin. It can be used on mucus membranes. Patient skin sensitivity is occasionally a problem.

Chlorhexidine gluconate. It is a broad-spectrum antiseptic that is better than povidone iodine as a bactericidal. This has a residual activity that continues to kill microorganisms after application. It is not effective in presence of organic materials like soaps and oils, blood and body fluids. It should be avoided in preparation of eye. It may be used alone or in combination with cetrimide.

Alcohol (70% ethyl or isopropyl alcohol), it is 95% effective against Gram-negative and Gram-positive bacteria, mycobacteria, fungi and viruses. It is not completely effective against spores. All traces of alcohol should be dry before drapes are put. Alcohol is never used on mucus membranes and open wounds as it may cause desiccation.

Drug treatment, e.g. prophylactic antibiotics (see section on Antibiotic Prophylaxis), antihypertensives, IV fluids, anticoagulants, vitamin K, etc. where relevant.

Non-drug treatment, e.g. rectal washouts, vaginal douches, stomach wash, etc. where relevant.

Handling of medicolegal cases

First aid has to be provided in all cases who report in an emergency state. After stabilizing the patient, patient should be properly guided and helped in shifting to the appropriate centre.

In case that we decide to treat, we must:
- Send an information, in duplicate, to the police.
- Prepare a medicolegal report.
- Preserve and seal clothes, etc.
- Preserve fluid and stain samples where indicated.
- Respond to information sought by the police.
- Arrange to take dying declaration, where indicated.
- Preserve all X-rays and patient records.
- Respond to court summons.
- In case of death, hand over the body to the police.
- In case of discharge/referral, police needs to be informed.

Care during transfer

This would depend on a number of factors like nature, patient's condition, and reasons for referral, readiness of the referral centre to accept the patient and whether the transfer is an emergency or elective.

Emergency transfer

- Identify the degree of emergency.
- Resuscitative measures to be adopted in serious patients with management of shock, oxygen, etc.
- Transfer in a well-equipped ambulance to a referral centre with prior intimation and confirmation of the readiness at the referral centre (see relevant section for specific care during transport).
- Doctor or paramedical staff to accompany the sick patient, if required.

Referral slip

Should contain information on:
- Condition of the patient when first seen.
- Diagnosis and resuscitative measures taken.
- Reasons for referral.
- Where referred.
- Precautions advised during transportation.
- Any other information (e.g. any staff or equipment sent along with, any communication given to referral centre or specialist concerned).

Reference

1. Medical Care of the Surgical Patient. In: Preoperative Medicine. Goldmann DR, Brown FH, Guarnieri DM (eds). 2nd Edition, McGraw Hill Company Inc; New York, 1994.

POSTOPERATIVE CARE

Postoperative pain relief

Postoperative pain is associated with all surgical procedures. This varies according to the surgical procedure. Severe pain can prolong gastrointestinal ileus, urinary retention,

impair respiratory movements producing atelectasis and predisposes to deep vein thrombosis due to immobilization.

Various methods to alleviate postoperative pain are NSAIDs, opioids (intramuscular, transdermal or transmucosal), patient controlled analgesia, local infiltration of anaesthetic drugs, epidural analgesia and intrapleural analgesia. The method used depends upon the site and the magnitude of surgery done, severity of pain, whether the patient is allowed orally, facilities and expertise available. It is necessary to give analgesics by intramuscular or intravenous route in the immediate postoperative period and till the patient is able to accept orally.

Commonly used agents are:

Inj. Diclofenac sodium 75 mg 6-8 hourly.

Or

Inj. Pentazocine (30 mg/ml) 30-60 mg IM/IV repeated 3-4 hourly.

Or

Inj. Tramadol (50 mg/ml) IM/IV 4-6 hourly.

Or

Inj. Morphine (15 mg/ml) 10-15 mg, can be repeated 4-6 times.

In tertiary care centres, epidural analgesia, intravenous patient controlled analgesia, intrapleural analgesia can be used under expert care.

When patient is able to accept orally:

Tab. Paracetamol 500 mg 3-4 times a day.

Or

Tab. Ibuprofen 400-600 mg 8 hourly.

Or

Tab. Nimesulide 100 mg twice daily.

Postoperative nausea and vomiting

Postoperative nausea and vomiting lead to significant morbidity and prolonged hospitalization. It has an incidence of 20-30% after abdominal surgery. Predisposing factors are diabetes mellitus, pregnancy, dehydration, electrolyte imbalance, gastroesophageal reflux, emergency surgery, use of certain anaesthetic drugs and opioids.

Treatment

Bowel obstruction (mechanical or paralytic ileus) should be ruled out as a cause of vomiting by proper examination and investigations, if it is associated with abdominal distension, fever and occurs beyond 3rd postoperative day.

Nausea and vomiting are managed with bed rest, intravenous fluids, analgesics to relieve postoperative pain, nasogastric decompression.

Pharmacological

Inj. Metoclopramide (5 mg/ml) 10 mg IM/IV 1-3 times daily or as and when needed.

Or

Inj. Ondansetron (2 mg/ml) 4 mg slow IV or IM.

In children: 100 mcg/kg (max 4 mg/day) by slow IV or IM.
Or
Inj. Promethazine (25 mg/ml) 2 ml IV as and when needed.

Postoperative pneumonia

Pulmonary disorders remain the most frequent postoperative problem and 10-15% of patients are considered to have clinically significant chest complication after surgery under general anaesthesia.

Factors predisposing to increased chest complications are smoking, obesity, chronic restrictive and obstructive lung disease, prolonged general anaesthesia and presence of nasogastric tube.

Postoperative pneumonia is caused by pathogens such as *Pseudomonas*, *Serratia*, *Klebsiella*, *Proteus* and *Streptococcus*.

SALIENT FEATURES

- Fever, productive cough, dyspnoea, chest pain.
- Bronchial breathing and presence of rales.
- Chest X-ray shows areas of consolidation.

Treatment

Nonpharmacological

Chest physiotherapy

Pharmacological

1. Antibiotics: Depending upon sputum culture and sensitivity. Initial treatment can be started with aminoglycoside and antipseudomonas Cephalosporins.
2. Inj. Ketorolac 30 mg every 6-8 hours IV or IM
   Or
   Inj. Diclofenac 75 mg IM every 6-8 hours.
3. Nebulized bronchodilators may be used, if bronchospasm is present.

Reference

1. Preoperative and Postoperative Management. In: Maingot's Abdominal Operation. Zinner MJ, Schwartz SI, Ellis H, (eds) 10th Edition, Prentice Hall International, 1997; pp. 461-478.

ANTIBIOTIC PROPHYLAXIS IN SURGERY

The goals of prophylactic administration of antibiotics to surgical patients are to: reduce the incidence of surgical site infection; use antibiotics in a manner that is supported by evidence of effectiveness; minimize the effect of antibiotics on the patient's normal bacterial flora; minimize adverse effects; cause minimal change to the patient's host defences.

Prophylaxis is uniformly recommended for all clean-contaminated, contaminated and dirty procedures. It is considered optional for most clean procedures, although it may be indicated for certain patients and clean procedures that fulfill specific risk criteria.

Note: Surgical antibiotic prophylaxis is an adjunct to, not a substitute for, good surgical technique. Antibiotic prophylaxis should be regarded as one component of an effective policy for the control of hospital-acquired infection.

Choice of antibiotic

Clean operations do not require antibiotics. Anyhow, when the implants are used antibiotics prescribed should be active against staphylococci. Clean contaminated operations require prophylactic antibiotics and must cover the common pathogens present in the body cavity which is opened during operation.

Table 18.1. Classification of operative wounds and risk of infection

Classification	Criteria	Risk (%)
Clean	Elective, not emergency, nontraumatic, primarily closed; no acute inflammation; no break in technique; respiratory, gastrointestinal, biliary and genitourinary tracts not entered	<2
Clean-contaminated	Urgent or emergency case that is otherwise clean; elective opening of respiratory, gastrointestinal, biliary or genitourinary tract with minimal spillage (e.g. appendectomy) not encountering infected urine or bile; minor technique break	<10
Contaminated	Nonpurulent inflammation; gross spillage from gastrointestinal tract; entry into biliary or genitourinary tract in the presence of infected bile or urine; major break in technique; penetrating trauma <4 hours old; chronic open wounds to be grafted or covered	~20
Dirty	Purulent inflammation (e.g. abscess); preoperative perforation of respiratory, gastrointestinal, biliary or genitourinary tract; penetrating trauma > 4 hours old	~40

Antibiotic selection is influenced by the organism most commonly causing wound infection in the specific procedure and by the relative costs of available agents. In certain gastrointestinal procedures, oral and intravenous administration of agents with activity against Gram-negative and anaerobic bacteria is warranted, as well as mechanical preparation of the bowel. Cefazolin provides adequate coverage for most types of procedures.

The antibiotics chosen for prophylaxis can be those used for active treatment of infection. However, the chosen antibiotics must reflect local, disease-specific information about the common pathogens and their antimicrobial susceptibility. A past history of a serious adverse event should preclude administration of a particular antibiotic like penicillin.

Penicillin allergy

In patients allergic to penicillins, challenge tests can be used to demonstrate cross-reactions with cephalosporins and carbapenems. However, the frequency of these relationships and their clinical significance is uncertain.

Timing and duration of prophylaxis

The first dose should always be given before the procedure, preferably within 30 minutes before incision. Re-administration at one to two half-lives of the antibiotic is recommended for the longer duration of the procedure. **In general, postoperative administration is not recommended.**

There may be situations where overriding factors alter the normal timing of administration. For example, during a caesarean section, prophylaxis should be delayed until the cord is clamped in order to prevent the drug reaching the neonate. When a tourniquet is to be applied the necessary tissue concentration must be achieved prior to its application rather than the time of incision. This probably occurs within 10 minutes of administration of an IV antibiotic injection.

Antibiotics should also be administered immediately after unexpected contamination of the tissues.

Additional doses during the operation

The individual surgeon is free to give an extra dose for prolonged operations or operations with major blood loss, if they wish. However, there is insufficient evidence to make a general recommendation.

Antibiotic prophylaxis should be confined to the perioperative period.

Route of administration

Intravenous administration of antibiotic prophylaxis immediately before or after induction of anaesthesia is the most reliable method for ensuring effective serum antibiotic concentrations at the time of surgery.

Dose selection

A single dose of antibiotic at the therapeutic concentration is sufficient for prophylaxis under most circumstances.

In adults, blood loss of up to 1500 ml during surgery or haemodilution up to 15 ml/kg does not require an additional dose of prophylactic agent.

In the event of major intraoperative blood loss (>1500 ml), additional doses of prophylactic antibiotic should be given after fluid replacement.

If antibiotic prophylaxis is necessary, the following medications are recommended (Table 18.2).

In procedures that require the insertion of implants or prosthetic devices, the term surgical site infection is used to encompass the surgical wound and the implant. Surgical site infection also encompasses infections involving the body cavity (e.g. a subphrenic abscess), bones, joints, meninges and other tissues involved in the operation.

Throughout this guideline, the term surgical site infection (SSI) is used, unless the evidence relates specifically to surgical wound infection.

Table 18.2. Suggested prophylactic regimens for operations at risk

Type of surgery	Organism encountered	Prophylactic regimen suggested
Vascular	*Staphylococcus epidermidis* *Staphylococcus aureus* (or MRSA) Aerobic Gram-negative bacilli	Three doses of flucloxacillin with or without gentamicin, vancomycin
Orthopaedic	*Staphylococcus aureus/* epidermidis	One or three doses of a wide spectrum cephalosporin
Oesophagogastric Anaerobic/viridans streptococci	Enterobacteriaceae Enterococci	One or three doses of a second generation cephalosporin and metronidazole in severe contamination
Biliary	Enterobacteriaceae Enterococci	One dose of a second generation cephalosporin
Small bowel	Enterobacteriaceae Anaerobes (mainly viridans)	One to three doses of a second generation cephalosporin with or without metronidazole.
Appendix/ colorectal	Enterobacteriaceae Anaerobes (mainly viridans)	Three doses of a second generation cephalosporin with metronidazole

Criteria for defining a surgical site infection (SSI)

Superficial incisional SSI

Infection occurs within 30 days after the operation and infection involves only skin of subcutaneous tissue of the incision and at least one of the following:

1. Purulent drainage, with or without laboratory confirmation, from the superficial incision.
2. Organisms isolated from an aseptically obtained culture of fluid or tissue from the superficial incision.
3. At least one of the following signs or symptoms of infection:
   - Pain or tenderness,
   - Localized swelling,
   - Redness, heat and superficial incision is deliberately opened by a surgeon, unless, incision is culture-negative
4. Diagnosis of superficial incisional SSI by the surgeon or attending physician

Deep incisional SSI

Infection occurs within 30 days after the operation, if no implant is left in place or within one year, if implant is in place and the infection appears to be related to the operation and infection involves deep soft tissues (e.g. fascial and muscle layers) of the incision and at least one of the following:

1. Purulent drainage from the deep incision, but not from the organ/space component of the surgical site.
2. A deep incision spontaneously dehisces or is deliberately opened by a surgeon when the patient has at least one of the following signs or symptoms:
   - Fever (>38°C)
   - Localized pain
   - Tenderness
   - Unless site is culture-negative
3. An abscess or other evidence of infection involving the deep incision is found on direct examination, during re-operation, or by histopathologic or radiologic examination.
4. Diagnosis of deep incisional SSI by a surgeon or attending physician.

Organ/space SSI

Infection occurs within 30 days after the operation, if no implant is left in place or within one year, if implant is in place and the infection appears to be related to the operation and infection involves any part of the anatomy (e.g. organs or spaces), other than the incision, which was opened or manipulated during an operation and at least one of the following:

1. Purulent discharge from a drain that is placed through a stab wound into the organ/space.
2. Organisms isolated from an aseptically obtained culture of fluid or tissue in the organ/space.
3. An abscess or other evidence of infection involving the organ/space that is found on direct examination, during re-operation, or by histopathologic or radiologic examination.

Diagnosis of an organ/space SSI by a surgeon or attending physician

Factors associated with increased risk of infection are:

Systemic factors. Diabetes, corticosteroid use, obesity, extremes of age, malnutrition, recent surgery, massive transfusion, multiple (3 or more) preoperative comorbid medical diagnoses American Society of Anesthesiologists class 3, 4 or 5.

Local factors. Foreign body, electrocautery; injection with epinephrine; wound drains; hair removal with razor; previous irradiation of site.

Development of local guidelines

It is expected that these guidelines will act as a framework for local development or modification after discussion with clinicians and management. These guidelines should be developed in conjunction with the Drugs and Therapeutics, Antibiotic and Protocol Development Committees. Responsibility for prophylaxis in each unit should be clearly assigned. This guideline should ideally be used in conjunction with local guidelines for the management of postoperative pyrexia. Guideline implementation should be supported by a programme of continuing education.

References

1. Antibiotic Prophylaxis in Surgery. A rational clinical guideline. Edinburgh (Scotland): Scotish Intercollegiate Guidelines Network (SIGN); 36p (SIGN publication; no. 45), 2000.
2. Current guidelines for Antibiotic Prophylaxis of Surgical Wounds. Woods RA, Delling EP. www.aafp.org/afp/980600ap/woods.html accessed.
3. Wound Infection. In: Bailey and Love's Short Practice of Surgery. Russel RCG, Williams NS, Bulstrode CJK (eds), 24th Edition, Arnold London, 2004; pp. 118-132.
4. Adherence to guidelines for antibiotic prophylaxis in general surgery: a critical appraisal. The Journal of Antimicrobial Chemotherapy 2008; 61: 244-218.

Postoperative wound management

Most postoperative wounds are covered with occlusive dressings.

The occlusive dressing (semipermeable to water vapours and oxygen but impermeable to liquids) consists of a hydrating layer (antibiotic ointments or petroleum jelly), a non-adherent contact layer, an absorbent and cushioning layer (gauze), and a securing layer like hypo-allergic tape.

Occlusive dressings should be applied within 2 hours of wounding and left on for at least 24 hours for optimal healing to occur for acute wounds. These should never be used on infected wounds. Dressing changes can be performed once or twice daily. If other types of occlusive are used, the timing of the dressing changes will vary between 1 and 7 days, depending on the wound characteristics.

Postoperative wound infection

Wound infections are classified as:

- Minor: For example, stitch abscess, cellulitis.
- Major: For example, presence of discrete collection of pus in wound.

Superficial infections are limited to skin and subcutaneous tissue. Deep infections involve the areas of wound below the fascia.

Postoperative cross-infection in wards. *Staphylococcus aureus* is the most frequently involved organism. Other less common organisms are *Enterococci*, *Pseudomonas*, *Proteus*, *E. coli* and *Klebsiella*.

SALIENT FEATURES

- Pain is unusually severe for the magnitude of procedure and lasts long.
- Fever: 101 to 102° F with tachycardia is usually present.
- Local examination: Wound is warm to touch and may be swollen and oedematous. Redness of the surrounding area and cellulites is often present.
- Wound infections are generally evident between 3rd and 6th postoperative days.

Treatment

Superficial infections:

1. Drainage: Wounds are managed by opening up the incision to provide adequate drainage.

2. Dressing: Daily dressing with Povidone iodine 5% and a wick is placed to prevent premature closure of the wound.
3. Analgesics: Tab. Ibuprofen 400 mg 3 times a day till pain is there.

Deep infections: Antibiotics are given on the basis of pus culture and sensitivity in addition to drainage of wound.

Prevention

Postoperative wound infection rate can be minimized by adequate skin preparation, bowel preparation, prophylactic antibiotics, and meticulous surgical technique.

WOUND CARE

Wounds can be classified as acute or chronic and further as arterial, venous, trophic, malignant, etc. (Table 18.3). Acute wounds heal uneventfully within an expected time frame, e.g. burns. For the purpose of guidelines, chronic wound can be defined as an ulcer present at least for 6 weeks.

Treatment

Meticulous wound care includes adequate cleansing, debridement, oedema control, and prevention of ischaemia, in addition to maintaining a moist wound environment and keeping the bacteria count as low as possible.

Acute wounds

The overall objectives in caring for wounds that are incompletely clotted are to minimize unnecessary blood loss and to avoid the formation of a haematoma.

1. Irrigate gently with copious quantities of water or normal saline. Debris and necrotic tissue should be removed without damaging healthy tissue. Sharp mechanical debridement may be necessary to expose viable tissue for large areas of fibrinous exudates or eschar. Chemical debridement is useful for those areas that are difficult to access by sharp debridement.
   Chemical debridement of the wounds may be done using topical agents—antiseptics (chlorhexidine, povidone iodine, alcohol, hydrogen peroxide, triclosan) and antibacterials (silver sulfadiazine, neomycin, polymyxin, bacitracin, mupirocin). When debridement is complete, dressings can be applied.
2. Healing of acute wound is further facilitated by closure. Alternatively, closure can be delayed for several days to allow infection to clear.

   Wound healing is impaired by malnutrition, oedema, bacterial contamination, ischaemia, smoking and immunosuppressant.

Chronic wounds (ulcers)

Identify and treat the predisposing factors, e.g. diabetes mellitus, peripheral arterial or venous disease, severe anaemia, protein deficiency, rheumatoid arthritis, systemic vasculitis, Cushing's syndrome and conditions requiring systemic steroid therapy.

Table 18.3. Clinical assessment of chronic ulcers

Type of ulcer	Clinical assessment	Investigation
Arterial	Involves deep fascia or deeper structure, decreased or absent distal pulses	Doppler US(ABPI<0.8)
Venous	Involves skin, subcutaneous fat Tortuous long/short saphenous veins Perforators incompetence	 Doppler US/venography
Tubercular	Undermined edge	Edge biopsy
Trophic	Punched out/undermined	
Malignant	Raised/everted margin	
	No evidence of granulation tissue	Edge biopsy

Nonpharmacological

- Encourage daily or twice a day bath; patient to avoid walking bare foot or with slippers and should be encouraged to wear shoes and socks.
- Patients with leg ulcer to reduce standing or excessive walking. In leg ulcer due to chronic venous insufficiency or oedema, patients should be advised to wear elastic stockings, elevation of leg and foot end of the bed while asleep along with some leg exercises to activate the calf muscle pump.

Pharmacological

Identify the microorganism and treat accordingly. Tubercular ulcer is treated with antitubercular drug (2HRZE+7HR) for at least 9 months (for details see section on Tuberculosis in Chapter 1).

Surgical treatment

Surgical debridement in ulcers associated with necrotic tissue or slough. Clean the wound with physiological normal saline or tap water only (antiseptics delay wound healing).

Daily dressing: Gauze adheres to the wound bed and it may remove viable tissue from the wound surface on removal, resulting in delayed wound healing. Some of the commonly used dressings are:

- Occlusive (moisture retentive) dressings (Hydrocolloid gel) in case of clean and shallow ulcers without any pus discharge or other features of infection. Occlusive dressings have barrier properties that enable to prolong the presence of moisture and wound fluid in the wound bed.
- Calcium alginate dressing: For bleeding wounds and wounds with a cavity.

Refer patients with chronic leg ulcer to vascular surgeons or general surgeons with some experience in peripheral vascular problems for surgical treatment.

Patient education

- To prevent ulcers in future, explain about the care of leg ulcers, wearing socks, shoes and compression stocking.

- Good personal hygiene (daily bath) and after bath the healed scar area should be massaged with an emollient cream such as lanolin or some other oil to keep the scar tissue soft and supple and prevent further breakdown.
- Regular use of calf muscle activating exercises and leg elevation and to avoid prolonged period of standing or sitting with legs down.
- In case of diabetic patients, control of diabetes is necessary.

References

1. Incisions, Closures and Management of Wound. In: Maingot's Abdominal Operators. 10th Edition, Prentice Hall International, 1997; pp. 395-426.
2. Wound Infection. In: Bailey and Love's Short Practice of Surgery. Russel RCG, Williams NS, Bulstrode CJK (eds), 24th Edition, Arnold London, 2004; pp. 118-132.
3. Bridget M. Kuehn: Chronic Wound Care Guidelines. JAMA 2007; 297: 938-939.

VARICOSE VEINS

Chronic venous disease of the lower limb is one of the most common conditions affecting the adults. Varicose veins, the most common complaint, represent one end of the spectrum of venous disease which extends through increasing degrees of venous insufficiency and may result in leg ulceration in the most severe cases.

Basle study venous classification

No venous disease.

Varicosities:

(i) Telangiectasia/hyphenwebs (spider veins): Intradermal varicose veins those are small and rarely symptomatic.

(ii) Reticular veins: Subcutaneous veins that begin at the tributaries of the trunk veins.

(iii) Trunk veins: Varicose veins of the greater/lesser saphenous system and its named tributaries.

These are the veins which are caused by incompetence of the valves connecting superficial and deep venous system. This leads to regurgitation of blood from high pressure deep venous system to superficial venous system. To accommodate this extra blood, the superficial veins dilate elongate and become tortuous, these are known as varicose veins. These require surgical correction. Secondary varicose veins, especially after deep venous thrombosis, require conservative therapy with elastic stockings.

Chronic venous insufficiency:

(i) Dilated subcutaneous veins.

(ii) Hyperpigmented/depigmented areas.

(iii) Open/healed ulcer.

SALIENT FEATURES

- Varicose veins refer to any dilated, tortuous, elongated vein, regardless of size.

- Duplex ultrasonography is confirmatory and also helps in localization of perforators and at times saphenopopliteal opening which is of immense help in the performance of operation.
- Evaluation of the deep venous system is a must in a patient with a history or clinical examination suggestive of deep venous thrombosis (leg oedema, present or past ulcer).

Treatment

- Carefully examine the lower limb for saphenofemoral reflux, varices and perforators in thigh and manifestations of venous insufficiency in calf and foot.
- Reassurance and use of elastic compression stockings.
- Definitive treatment includes injection sclerotherapy or surgical treatment.

Surgical

Saphenofemoral incompetence is treated with flush ligation at saphenofemoral junction and stripping up to just above knee. Saphenopopliteal incompetence is treated with flush ligation at saphenopopliteal junction. Perforator incompetence is treatd with radical perforator ligation either by open or endoscopic method provided deep venous system is patent and has competent valves.

Postoperative management

1. Compression bandaging immediately following stripping or avulsion of veins. Replace bandages by compression stocking after 2 days.
2. Limb elevation and encourage the patient to walk with compression stockings after first change of dressing 48 hours after operation.
3. Postoperative pain is controlled with dextropropoxyphene or NSAIDs.

Patient education

- Certain do's are leg exercise, leg elevation, wear stockings and drinking 4-5 L of fluids in a day.
- Certain don'ts are hot bath, exposure to extremes of temperature, pregnancy, contraceptive pills and oestrogens, long journeys (flight).
- Teach the patient leg exercises—frequent movements of toes and heels, *Sarvangasan* or *Shirshasan*, and elevation of foot end of the bed about 6 inches by putting a block of wood or 2 bricks under foot end of bed.
- To avoid prolonged standing or dangling legs down.

Reference

1. Venous Disorders. In: Bailey and Love's Short Practice of Surgery. Russel RCG, Williams NS, Bulstrode CJK. (eds), 24th Edition, Arnold London, 2004; pp. 956-967.

CERVICAL LYMPHADENOPATHY

An enlarged cervical lymph node is the commonest cause of lump in the neck. Cervical lymph nodes may become enlarged as a result of inflammation or neoplastic process (Table 18.4). Tuberculosis is one of the commonest cause of cervical lymphadenopathy.

Treatment

Detailed history and examination are essential to pinpoint specific aetiology. Majority of the lymph nodes are reactive to viral infections of upper respiratory tract and, therefore, do not require any treatment.

Table 18.4. Causes of lymphadenopathy and clinical features

Condition	Causes	Clinical features
Acute inflammation	Infection of the aerodigestive tract, head and neck or other infections	Fever, sore throat, firm, tender nodes 1-2 cm in diameter
Chronic inflammation	Tuberculosis, sarcoidosis, Histiocytosis X	Swelling in the neck and fever, cough may or may not be present Variable on presentation depending on the stage of the disease: multiple matted lymph nodes/cold abscess
Lymphomas	Hodgkin's/Non-Hodgkin's lymphoma	Large painless rubbery lymph nodes.
Metastatic	Carcinomas of the upper aerodigestive tract, skin tumours of the head and neck: squamous cell carcinoma, basal cell carcinoma, melanoma.	Symptoms related to primary disease, firm to hard lymph node enlargement

A. In case of acute suppurative lymphadenopathy secondary to any focus of bacterial infection in the drainage area:
   Cap. Cephalexin 250-500 mg every 6 hours for 7 days.
   Or
   Cap. Amoxicillin 250-500 mg every 8 hours for 7 days.
   If lymph nodes persist, perform fine needle aspiration cytology (FNAC) and treat accordingly. If FNAC is nonconclusive, take a biopsy from the enlarged lymph node and treat accordingly.
B. In case of chronic lymphadenopathy, perform FNAC and treat accordingly. If FNAC is nonconclusive, perform biopsy and treat accordingly.

Treatment (tubercular lymphadenopathy)

Start antitubercular therapy (see section on Tuberculosis in Chapter 1).

Reassess the patient after three months of therapy and persistent lymph node requires excisional biopsy. Part of the lymph node should be sent for histology and

part for AFB culture. Second line of therapy will depend upon AFB culture and sensitivity.

References

1. The Neck. In: The New Aird's Companion in Surgical Studies. Burnand KG, Young AE, 2nd Edition, Churchill Livingstone, London 1998; pp. 451-455.
2. Cysts, ulcers and sinuses. In: Bailey and Love's Short Practice of Surgery. Russel RCG, Williams NS, Bulstrode CJK (eds), 24th Edition, Arnold, London, 2004; pp. 207-212.

THYROID SWELLING

Thyroid swelling forms one of the most important differentials for swelling in front of the neck. The differential diagnoses of thyroid swelling are benign goiter, intrathyroid cysts, thyroiditis, benign and malignant tumours. Simple goitre is enlarged thyroid gland and occurs commonly around puberty in girls due to iodine deficiency. Malignancy should be suspected in case of extremes of age, male sex, rapidly growing swelling, persisting pain, dysphagia, recurrent laryngeal nerve palsy, hardness and fixity of the thyroid gland and presence of one or more palpable neck nodes. Fine needle aspiration cytology, isotope scan and ultrasonography are helpful in differentiating the causes of thyroid swelling.

Treatment

Management of the thyroid diseases is summarized in flowchart (Fig. 18.1).

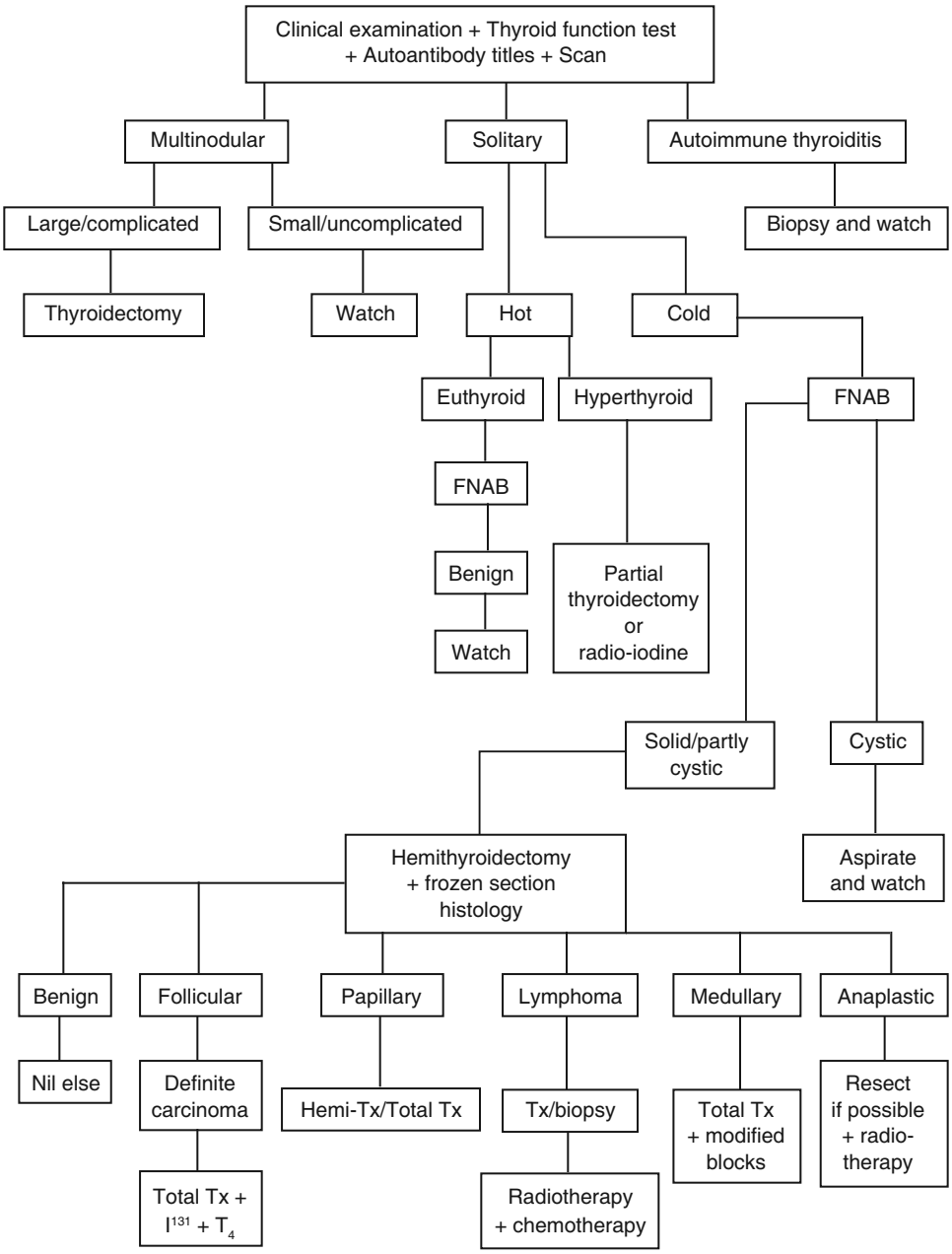
Thyroidectomy

Preoperative care. Prior to thyroidectomy, indirect laryngoscopy (IDL) is performed to identify compensated or unsuspected recurrent laryngeal nerve palsy. Before operation, thyrotoxic patients should be made euthyroid with antithyroid drugs (carbimazole 10-15 mg 4 times a day and propranolol 20 mg 3 times a day). Fully discuss the potential complications with the patients—mentioning the risk to parathyroid gland and recurrent laryngeal nerve.

Postoperative care. Place patient in a slightly propped up position. Carefully observe for respiratory insufficiency, haemorrhage from the wound, irritability to the facial nerve and carpopedal spasm (parathyroid injury). Monitor drain output daily and remove, if 24 hours output becomes lesser than 10 ml. Check wound site for infection and suture removed on the 5th day.

Complications. The most immediate life-threatening complication is haemorrhage under deep cervical fascia, which can lead to acute asphyxia. Management includes reopening of the suture line, to drainage of the haematoma and re-exploration for control of bleeders. Damage to recurrent laryngeal nerve can lead to respiratory distress (bilateral recurrent laryngeal nerve) and hoarseness of voice. Parathyroid damage leads to hypocalcaemia.

Symptomatic hypocalcaemia (positive Chovstek's or Trousseau's signs or corrected serum calcium level < 8 g/dl) is treated with 10% calcium gluconate intravenously.



(Tx—thyroidectomy, T_4—Suppressive thyroxine therapy, FNAB—Fine needle aspiration biopsy)

Fig. 18.1. Management plan for thyroid nodule.

If hypocalcaemia persists, oral calcium supplement and synthetic Vitamin D are necessary.

Late complications include recurrent thyrotoxicosis (Graves' disease), hypothyroidism, and recurrence of malignancy at the local site or in the lymph nodes in the neck.

The patients operated for nodular goiter might require long-term thyroxine therapy.

Patients operated for well-differentiated carcinoma of thyroid will require post-operative thyroid scan and ablation of residual thyroid with radioiodine.

If ablation of thyroid is complete, follow-up of these patients is with thyroglobulin every 6 months and rising titers of thyroglobulin is an indication of radioactive scan. Since ablation of thyroid is complete, these patients will require life-long thyroxine.

Radioiodine therapy is indicated in follicular, papillary and mixed carcinoma. Following total thyroidectomy, a total body radioactive isotope scan should be arranged four weeks after the operation. During this period, L-thyroxine therapy should be withheld. If radioactive scan shows residual thyroid tissue or metastatic deposit, then further dose of radioiodine should be given to ablate these. Following isotope scan, high dose L-thyroxin (0.2-0.3 mg) should be started and continued for life. Radioactive iodine has no role in residual/metastatic medullary carcinoma. Treatment approach to Hurthle cell neoplasm is similar to follicular neoplasm.

Follow-up

Patients should be followed at three monthly intervals for the initial 2 years and 6 monthly for next 3 years and then at yearly interval for life. On each follow-up visit, patient should be examined for any local or nodal recurrence in the neck, a chest X-ray should be done to exclude pulmonary deposit and clinical features of thyroid toxicity noted and dose of L-thyroxine regulated.

References

1. The Thyroid Gland. In: The New Aird's Companion in Surgical Studies. Burnand KG, Young AE (eds), 2nd Edition, Churchill Livingstone, London, 1998; pp. 459-485.
2. The Thyroid gland and the thyroglossal tract. In: Bailey and Love's Short Practice of Surgery. Russel RCG, Williams NS, Bulstrode CJK (eds), 24th Edition, Arnold, London, 2004; pp. 776-804.

BREAST ABSCESS

Breast abscesses can be classified into mastitis neonatorum, lactating epidemic or sporadic mastitis, and non-lactating breast abscesses.

Usually caused by highly virulent strains of penicillin resistant *Staphylococcus aureus* and anaerobic *streptococci*.

Treatment

Nonpharmacological

Rest and support to the breast and to continue breastfeeding from both the breasts; however, in case of larger abscess shift to bottle feeding.

Pharmacological

In early stage (induration only):

1. Tab. Erythromycin 500 mg 3 times a day for 7 days.
   Or
   Tab Roxithromycin 150 mg twice a day.
2. Tab. Metronidazole 400 mg 3 times a day for 7 days.
3. Tab. Ibuprofen 400 mg as and when required.

In case of no improvement or large abscess:

1. Antibiotics as above.
2. Incision and drainage of pus through thinned skin over the abscess (Large abscesses require operation under intercostal block or general anaesthesia).
3. Daily dressing.
   In some cases, suppress lactation with hormones, if the mother finds breastfeeding too painful.

Patient education

- To maintain good hygiene and to continue breastfeeding from both the sides unless it is a large abscess and very painful.
- Advise on timely weaning of the infant.

Reference

1. Abscesses in Special Sites. In: Hamilton Bailey's Emergency Surgery. Ellis BW, Paterson-Brown S (eds), 13th Edition, Arnold, London, 2000; pp. 165-166.

DYSPHAGIA

Dysphagia is the sensation of difficulty in swallowing. It may be due to general causes, e.g. myasthenia gravis, bulbar palsy, hysteria, etc. or due to the local causes. The latter may be:

a. Intraluminal (e.g. foreign body)
b. Intramural (e.g. achalasia, oesophagitis, oesophageal strictures, Plummer-Vinson syndrome, pharyngeal pouch, benign neoplasm, malignant neoplasm)
c. Extraluminal (e.g. retrosternal goitre, mediastinal tumour, mediastinal lymphadenopathy, aortic aneurysm, hiatus hernia).

SALIENT FEATURES

- Difficulty in swallowing (solids and/or liquids), oesophageal pain, regurgitation and aspiration.

Investigations

- Barium swallow to evaluate cause, site and extent of the lesion and the state of the oesophagus above and below the lesion;
- Upper GI endoscopy for direct visual evaluation and for taking tissue for histopathological examination wherever indicated.
- Abdominal ultrasound, chest X- ray and other routine investigations.
- CT scan and endoscopic ultrasound to be considered in tertiary care centres, wherever indicated; and
- Oesophageal manometry, pH studies and evaluation for *H. pylori* to be considered in tertiary care centres, wherever indicated.

Treatment

Definitive treatment depends on the cause and its extent.

Nonpharmacological

- Diet restricted to liquids or semisolids depending upon extent of dysphagia.
- Psychotherapy, if the patient is depressed or demoralized.

Pharmacological

Gel Magnesium hydroxide + Aluminium hydroxide + Activated Dimethicone (250 mg + 250 mg + 50 mg/ml) 20 ml 6 hourly.

Or

Tab. Ranitidine 150 mg 2 times a day.

Reference

1. Dysphagia. In: Harrison's Principles of Internal Medicine. Kasper DL, Braunwald E, Fauci AS et al (eds), 16th Edition, McGraw Hill Company Inc., New York, 2005; pp. 217-219.

ACUTE ABDOMEN

Abdominal pain can occur due to variety of medical and surgical causes. It is important to elicit a detailed clinical history and perform abdominal examination to determine the cause of pain. In very severe cases, it may be necessary to give treatment before proper history can be obtained or examination is allowed by the patient.

Causes of acute abdomen

Abdominal causes

1. Inflammation of peritoneum due to bacterial or chemical contamination. Perforation of appendix or bowel, ulcer, pancreatitis or pelvic inflammatory disease.
2. Mechanical obstruction of hollow viscera—intestinal obstruction, ureteric obstruction due to stone or other causes, and obstruction of the biliary tree.
3. Vascular disturbances—vascular rupture, embolism or thrombosis, torsion of pedicle.

4. Abdominal wall injury or infection in the muscles. Referred pain in case of pneumonia, angina, spine-radiculitis and torsion of testis.

Metabolic causes

Insect bite, lead poisoning, uraemia, diabetic ketoacidosis, porphyria and other allergic causes.

Neurogenic causes

1. Organic—Tabes dorsalis, Herpes zoster, neuralgia.
2. Functional.

Approach to the patient with acute abdomen

1. In view of the variety of causes, it is absolutely essential to elicit an orderly detailed history about the nature of pain and perform a sequential examination. Narcotics or analgesics should be withheld till the diagnosis is made.
2. A proper history can provide more valuable information than the investigations. The features of the history that must be elicited are site, time and nature of onset, severity, nature of pain, progression, duration, relieving factors, exacerbating factors and radiation. History of GI complaints like vomiting, constipation, haematemesis and melaena and urinary complaints should be obtained.
3. Examination of the patient with respect to facies, posture in the bed, respiration can help in localizing the cause and nature of pain. The abdominal examination should be thorough but extremely gentle starting from the nontender area. Points to be noted are area of maximum tenderness, guarding, rebound tenderness, bowel sounds, obliteration of liver dullness and presence of any associated mass or free fluid in the abdomen.
4. It is important not to miss examination of supraclavicular lymph nodes, hernial orifices, peripheral pulsations, genitalia, bowel sounds and rectal and/or vaginal examination.
5. Laboratory investigations depend upon the suspected cause of pain and include haemogram, kidney function tests, liver function tests, serum or urinary amylase and lipase, blood sugar and urinalysis. Special analysis like serum lead estimations may be needed, if deemed necessary.
6. Radiological investigations include plain radiographs of abdomen, supine and erect and chest. In a sick patient, lateral decubitus X-ray may provide the same information. Ultrasound, computed tomography and special radiological investigations may be done as and when required.
7. Invasive procedures like endoscopy and laparoscopy are done only if indicated.
8. It may be necessary to rush the patient to operation room, if there is suggestion of intra-abdominal haemorrhage along with pain. Any delay for history, examination and investigations can cause more harm to the patient.
9. There may be occasions when the cause of the pain cannot be determined on the basis of clinical examination and investigations. Under such circumstances, it is

prudent to provide pain relief to the patient and keep him under observation to watch for development of new signs or symptoms.

Treatment

Treatment of acute abdomen depends upon the cause of pain. In case of medical causes of pain, remove the offending cause or treat appropriately.

Pharmacological

For pain relief, Inj. Diclofenac sodium 75 mg IM. Any patient who does not respond to the pain relief or pain reappears must be referred to surgeon for further evaluation.

Surgical

Any acute surgical cause of acute abdomen like perforation peritonitis, appendicitis, perforation of ulcer, etc. should be treated immediately and appropriately.

Patient education

1. Do not administer analgesics for acute abdomen on your own. This may delay treatment of surgical cause.
2. Enema should not be self-administered for constipation without advice of the treating physician/surgeon.
3. Narcotic analgesics should be taken for minimum period as long-term intake may lead to addiction.

Reference

1. Abdominal Pain. In: Harrison's Principles of Internal Medicine. Kasper DL, Braunwald E, Fauci AS et al (eds), 16th Edition, McGraw Hill Company Inc., New York, 2005; pp. 82-84.

CHOLELITHIASIS

Most patients with cholelithiasis have stones exclusively in the gallbladder, but 15% of patients, in addition, have common bile duct (CBD) stones.

SALIENT FEATURES

- Most patients are asymptomatic, some patients present with dyspepsia or vague epigastric pain. The remaining patients may present with recurrent biliary colics or with acute cholecystitis or with symptoms of CBD disease or gallstone or pancreatitis.
- Obesity, fertility and diabetes are known to increase the chances of gallstone formation.
- Diagnosis made clinically and confirmed by ultrasonography.

Treatment

Low fat diet with no spices.

Definitive treatment is cholecystectomy in symptomatic and asymptomatic patients with diabetes or a solitary large stone or multiple small stones with wide cystic duct or porcelain gallbladder or anxious patients. If the patient comes after 48 hours, manage conservatively and cholecystectomy after 6-8 weeks.

Expectant management. In case of acute cholecystitis, empyema gallbladder, and stones in the CBD, Maintenance IV fluids (for details see section on Fluid and Electrolyte Imbalance in Adults in Chapter 1 and Children in Chapter 19).

1. a. Inj. Ciprofloxacin (infusion 100 mg/50 ml) 100 ml IV twice a day.
   b. Inj. Gentamicin (40 mg/ml) 2 ml IV 8 hourly.
   Or
   a. Inj. Ampicillin (500 mg/ml) 1 ml IV 6 hourly.
   b. Inj. Cloxacillin (500 mg/ml) 1 ml IV 6 hourly.
   Or
   a. Inj. Ciprofloxacin (infusion (100 mg/50 ml) 100 ml IV twice a day.
   b. Inj. Amikacin (500 mg/2 ml) 2 ml twice a day.
2. In case anaerobic bacterial infection is suspected or anticipated, give
   Inj. Metronidazole (500 mg/100 ml) 100 ml IV 8 hourly.
3. Inj. Diclofenac sodium (25 mg/ml) 2-3 ml IM as and when required or 6 hourly.
   Or
   Inj. Pentazocin lactate 930 mg/ml) 1 ml as and when required.
4. In patients having obstructive jaundice, add Inj. Vitamin K (10 mg/ml) 1 ml IM once or twice a day till prothrombin time reaches to a satisfactory level.

Antibiotics are usually stopped after 5-7 days unless the patient has evidence of persistent infection or has indwelling tube (e.g. T-tube).

Patient education

- To avoid fatty and fried meals for 3 months.
- Although ambulation is encouraged as early as possible, heavy physical exertion should be avoided for 2 weeks (after laparoscopic cholecystectomy) and for 3 months after conventional cholecystectomy.
- If T-tube has been placed, it should be removed after 2-3 weeks, after ensuring that the CBD is patent, non-dilated and there is free flow of contrast into the duodenum during T-tube cholangiography.

Reference

1. Cholelithiasis and Cholecystectomy. In: Maingot's Abdominal Operations, Zinner MJ, Schwartz SI, Ellis H (eds), 10th Edition, Prentice Hall International, 1997; pp. 1717-1738.

APPENDICITIS

Appendicitis is the commonest cause of acute abdomen and may appear as catarrhal appendicitis or as obstructive appendicitis and sometimes it may present as an appendicular lump or appendicular abscess or as burst appendix with peritonitis.

SALIENT FEATURES

- Acute central abdominal pain, followed by nausea, vomiting and fever, with the pain after a variable period, shifting to right lower abdomen localized tenderness maximum at the McBurney's point, rebound tenderness and guarding in the right iliac fossa.
- An inflammatory lump in the right lower abdomen or signs of peritonitis.
- A polymorphonuclear leucocytosis and ultrasonographic appearances may help to corroborate the clinical diagnosis.
- Investigations are primarily undertaken to exclude other conditions like ectopic gestation or ureteric calculus.

Treatment

The definitive treatment is appendicectomy and the sooner it is done, the better. It can be performed laparoscopically, if facilities and expertise available. Surgery should be delayed, if the patient is moribund with advance peritonitis where the conservative measures will need to be supplemented by measures to make him fit for operation. An interval appendicectomy should be performed where a lump has formed or when attack has already resolved or circumstances make surgery not feasible.

Nonpharmacological

Stop oral feeding.

Pharmacological (expectant management)

1. Intravenous fluids to maintain hydration. Requirement of fluids would be more, if the patient has peritonitis and septicaemia.
2. Inj. Ciprofloxacin infusion (100 mg/50 ml) 100 ml twice a day for 5 days.
3. Inj. Gentamicin (40 mg/ml), 80 mg IV 8 hourly.
   Or
   Inj. Amikacin (500 mg/2 ml), 2 ml IV twice a day.
4. Inj. Metronidazole infusion (500 mg/100 ml) 100 ml IV 8 hourly.
5. Inj. Diclofenac sodium (25 mg/ml) 50 ml IM SOS.
   (**Caution**: Purgation and enema are contraindicated.)

Pain subsides first, followed by relaxation of the abdomen and control of fever. Tenderness disappears later. Polymorphonuclear leucocytosis tends to settle down. Failure of signs and symptoms to subside or the appearance of new signs and symptoms during expectant treatment, calls for surgical intervention.

Postoperative management

- Oral feeding is started when abdomen is soft, the patient has passed flatus/stools and bowel sounds have appeared. Start with liquids, gradually permitting semisolid and solid diet over a period of 2-3 days.

- Antibiotics should continue for 5 days or more, if the condition demands. Initially antibiotics are given by parenteral route and later switched to oral route when the patient starts tolerating semisolid diet.
- Patient is discharged usually between 3rd and 5th postoperative day, if comfortable, ambulatory, tolerating semisolid or solid food, afebrile and has a healthy wound.
- Sutures are removed around 7th postoperative day.

Patient education

- Normal routine physical work can be permitted in 10-15 days (5-7 days after laparoscopic appendicectomy).
- Moderate physical work is permitted after 4-6 weeks (2 weeks after laparoscopic appendicectomy).
- Heavy physical work is permitted after 2-3 months (4-6 weeks after laparoscopic appendicectomy).

Reference

1. Appendix and Appendicectomy. In: Maingot's Abdominal Operations. Zinner MJ, Schwartz SI, Ellis H (eds), 10th Edition, Prentice Hall International. 1997; pp. 1191-1228.

RETENTION OF URINE

Retention of urine is inability to pass urine. It can be either acute or chronic. *Mechanical* causes of retention are: posterior urethral valves, foreign bodies, tumours, blood clot and stones, phimosis, paraphimosis, trauma (rupture of urethra or bladder), urethral stricture, urethritis, meatal ulcer, tumours, prostatic enlargement—benign or malignant, retroverted gravid uterus, fibroid, ovarian cyst, faecal impaction. *Neurogenic*—postoperative retention, neurogenic bladder, spinal cord injuries, hysteria, drugs—anticholinergics, antihistaminics, smooth muscle relaxants.

SALIENT FEATURES

- Acute retention of urine is characterized by inability to pass urine despite urge, suprapubic discomfort or severe agonizing pain. There may be previous such episodes or history of trauma, instrumentation or surgery.
- Chronic retention is an enlarged painless bladder whether or not the patient is having difficulty with micturition. Some times acute episode can be precipitated in cases of chronic retention of urine.
- There may be symptoms suggestive of prostatic enlargement in elderly male.
- On examination, there is suprapubic swelling arising out of pelvis in the midline in the hypogastric region that is dull to percussion and cystic in nature. This helps to differentiate from anuria where urinary bladder is not palpable.
- Rectal examination will help to confirm the prostatic pathology in elderly patients.
- Spinal defects or neurological findings suggest presence of neurogenic bladder.

Treatment

1. General measures include sedation, adequate hydration and antibiotics, if sepsis is present.
2. If there is history of trauma, urethral injury should be ruled out before attempting catheterization.
3. If urethra is patent, a catheter is passed into the bladder under strict aseptic precautions and is connected to a sterile closed collecting system. The catheter is chosen according to the size of the external meatus. In cases of acute retention, single catheterization is adequate or an indwelling self-retaining catheter is inserted, if deemed necessary.
4. If urethral pathology is present or there is inability to pass the catheter, a suprapubic puncture or cystostomy is performed to relieve the retention.
5. In case of chronic retention, decompression should be performed intermittently (300-400 ml volume) to avoid haematuria that can occur after sudden decompression.
6. The patient should be kept under observation after admission for investigation to elucidate the cause of retention. The investigations include urine examination, renal functions, plain and contrast radiological studies; ultrasound, CT scan or MRI. Urodynamic studies are required to diagnose neurogenic bladder. Cystoscopy can help to diagnose and treat many conditions of the urethra and urinary bladder.
7. Definitive treatment of the aetiology is done after proper investigations.

Pharmacological

1. Tab. Cotrimoxazole (960 mg) 2 times a day
   Or
   Tab. Norfloxacin 400 mg 2 times a day for 5-7 days. This may be changed according to urine culture and sensitivity reports.

Patient education

- Explain catheter care measures—tip of the urethra should be cleaned with antiseptic solution regularly.
- Watch for blood in urine.
- Avoid pull on catheter.

Reference

1. The Urinary Bladder. In: Bailey and Love's Short Practice of Surgery. Russel RCG, Williams NS, Bulstrode CJK (eds), 24th Edition, Arnold, London, 2004; pp. 1334-1369.

INGUINAL HERNIA

Hernia occurs due to raised intra-abdominal pressure due to various causes or weakness of the body wall due to any disease. A hernia consists of the sac, the coverings and the contents of the sac that could be omentum, intestine, circumference of intestine, ovary or Meckel's diverticulum. Most common type of the external hernia is the inguinal

hernia, less common being femoral and umbilical. In this section, management of inguinal hernia is discussed.

SALIENT FEATURES

- Pain and swelling in the groin. The swelling increases as the duration of hernia increases. Reducible hernia requires a planned surgery.
- Irreducible hernia is defined as hernia which is not reducible without any other symptom, requires early referral to surgeon.
- Obstructed hernia is irreducible hernia with signs of intestinal obstruction, requires urgent referral to surgeon.
- Strangulated hernia is irreducible hernia with or without intestinal obstruction, with pain at the local site with tenderness and signs of inflammation in the hernia requires urgent referral to surgeon.

Treatment

Surgical treatment

The treatment of choice for hernia is surgical repair. The surgery is advocated as soon as the diagnosis is made since the complications are common. Even in children, hernia repair is done at the earliest after diagnosis. Any predisposing factors need to be treated first before hernia repair else recurrence is possible. The hernia with complications needs to be operated in emergency.

Treatment in children entails herniotomy while in adults repair of the posterior wall of the inguinal canal without (herniorrhaphy) or with prosthesis (hernioplasty) after high ligation and division of the sac is done. This can be done by open repair or laparoscopic repair by the experts. Day care surgery under local anaesthesia is practiced at many centres.

Complications of herniorrhaphy include infection, haematoma formation, injury to viscera like urinary bladder, injury to vas and recurrence.

Nonsurgical treatment

Truss is not advocated for the treatment of hernia except in the extremely frail patients unfit for surgery or where surgery is refused by the patient. Application of external pressure causes trauma to skin and may cause injury to the contents.

Patient education

- Reduce weight and quit smoking before surgery.
- Treatment of any predisposing factors like chronic cough, prostatic enlargement and constipation is necessary.
- The surgery should not be delayed since complications of hernia are frequent and can be serious.
- After surgery, avoid lifting heavy weights, cycling, etc. for three months.

References

1. Hernias. In: Maingot's Abdominal Operations. Zinner MJ, Schwartz SI, Ellis H (eds), 10th Edition, Prentice Hall International, 1997; pp. 497-580.
2. Hernias, umbilicus and abdominal wall. In: Bailey and Love's Short Practice of Surgery. Russel RCG, Williams NS, Bulstrode CJK. (eds), 24th Edition, Arnold London, 2004; pp. 1272-1293.

SCROTAL SWELLINGS

Scrotal swellings can be either congenital or acquired. The acquired scrotal swellings could be further classified as inflammatory, traumatic or malignant. Important diagnoses include hydrocoele, epididymo-orchitis, torsion of testis and tumours.

A. Hydrocoele

This is a collection of fluid in some part of processus vaginalis usually tunica. It can occur in children and adults. Hydrocoele could be primary or secondary to testicular diseases like inflammation, infections or malignancy. It can be unilateral or bilateral.

SALIENT FEATURES

- Cystic swelling usually translucent, it is possible to reach above the swelling and it is not possible to feel the testis distinct from the swelling. Although there is history of reduction of size in children, it is not reducible.
- Complications include rupture, haematocoele formation, infection (pyocoele), calcification and testicular atrophy and herniation through the dartos muscle in long-standing cases.

Treatment

In infants, it is advised to wait till the age of two years to allow spontaneous resolution. Beyond the age of two years, the surgical treatment entails herniotomy by the inguinal approach.

In adults, definitive treatment requires drainage of the fluid along with eversion of the sac with or without excision of the same. This can be done under local or regional anaesthesia.

B. Epididymo-orchitis

Epididymo-orchitis is inflammation of the epididymis and the testis due to various causes. It can be acute or chronic. Infection reaches the epididymis via the vas deferens from the lower urinary tract. A history of urinary tract infection is usually available. The condition has to be differentiated from torsion of testis (as given below).

SALIENT FEATURES

- The epididymis and the testis show swelling with shiny oedematous skin and tenderness. It may be possible to feel the epididymis and testis separately. The pain is relieved by rest and elevation of testis.
- Urine examination shows pus cells. Complications include secondary hydrocoele with clear fluid, abscess formation and pus discharge from sinus formation.

Treatment

Bed rest and scrotal support.

Pharmacological

1. Cap. Doxycycline 100 mg once daily for 8-10 days. It may be changed according to urine culture and sensitivity.
2. Analgesic and antipyretics may be required.

C. Torsion of Testis

Torsion of testis is most common between ages of 10-25 years though it may occur at any age.

SALIENT FEATURES

- There is sudden onset of pain in the affected testis and lower abdomen.
- The testis is tender; lies higher as compared to its counterpart; the opposite testis lies horizontally; it isn't possible to palpate testis and epididymis separately; pain increases on elevation of testis and secondary haemorrhagic hydrocoele.
- Ultrasound examination and colour Doppler examination demonstrate torsion of testis and resultant obstruction of the blood supply.

Treatment (Immediately refer to a higher centre)

Treatment of torsion of testis requires immediate correction by surgical exploration through scrotal incision, untwisting of the cord and orchiopexy.

It is important to fix the opposite testis at the same time. It is of paramount importance NOT to delay the exploration even if diagnosis is doubtful or for the want of special investigations. Any undue delay can lead to gangrene of the testis.

Patient education

- Any scrotal swelling should be brought to notice of your doctor.
- Any sudden onset swelling of the testis merits immediate attention of the surgeon and delay in diagnosis or treatment even for few hours can be harmful.

Reference

1. Disorders of the Testis, Scrotum and Spermatic Cord. In: Smiths General Urology. Tanagho EA, McAninch JW (Eds), 15th Edition, McGraw Hill Company Inc., New York, 2000; pp. 684-693.

FISSURE-IN-ANO

An anal fissure is an elongated ulcer in relation to anal canal. It most commonly occurs in the midline posteriorly. Most cases are idiopathic and may be due to trauma and ischaemia. Specific causes of fissure are incorrect operation for haemorrhoids, inflammatory bowel disease and sexually transmitted diseases. These can be acute and chronic.

SALIENT FEATURES

- The severe pain on defaecation that promotes constipation.
- Bleeding is usually small and occurs as a streak by the side of stools.
- A foul smelling discharge is present in chronic cases.
- On examination, a longitudinal ulcer is seen in the midline posteriorly that may be covered by a skin tag. There is local inflammation and induration.

Treatment

The aim of the treatment is to obtain complete relaxation of the sphincter and provide relief from pain.

Nonpharmacological

- Sitz bath—sitting in a tub containing lukewarm water with potassium permanganate to provide relief from spasm and pain.
- Local hygiene.
- High fibre diet to prevent constipation.

Nonsurgical

- 2% Glycerine trinitrate as an ointment for local application.
- 5% Lignocaine as an ointment for local application.

Surgical

- Lateral anal sphincterotomy.
- Dorsal fissurectomy and sphincterotomy.

Complication of surgical treatment could include mild incontinence and prolonged healing time.

Patient education

- Local care of the region and Sitz bath should be regularly taken.
- Avoid constipation by the use of high fibre diet and use of purgatives.

FISTULA-IN-ANO

Fistula-in-ano is a tract lined by granulation that connects superficially the skin around the anus and deeply the anal canal or the rectum. Low level fistula opens into the anal canal below the anorectal ring. The high level fistula opens into the canal at or above the anorectal ring. It is important to know the level of fistula since a low level fistula can be laid open without fear of incontinence.

SALIENT FEATURES

- Persistent seropurulent discharge that may be blood-stained.
- Pain and sometimes a history of a perianal abscess that has been drained.
- Fistula-in-ano may be associated with tuberculosis, Crohn's disease, carcinoma, bilharziasis.
- There is usually an opening within 3-4 cm of the anal orifice with granulation tissue. The fistula heals only to recur later on. Digital examination may reveal the internal opening.

Treatment

Nonpharmacological

Local hygiene and Sitz bath. Diet modification to avoid constipation.

Pharmacological

Bulk laxative to relieve and avoid constipation.

Surgical

Definitive treatment is fistulotomy (laying open of the fistula tract), fistulectomy (excision of the fistula tract) and use of Seton. Secondary fistula needs treatment of primary disease. High level fistula may need proximal colostomy for treatment.

Patient education

- Do not take treatment for anal disorders like abscess and fistula from unqualified persons.
- Avoid constipation and take bulk laxatives.
- Maintain local hygiene.

Reference

1. Benign Diseases of the Anorectum. In: Maingot's Abdominal Operations. Zinner MJ, Schwatz SI, Ellis H (Eds), 10th Edition, Prentice Hall International. London, 1997; pp. 1437-1454.

HAEMORRHOIDS

Haemorrhoids (commonly called piles) are the dilated tortuous veins occurring in relation to the anus. These can be primary or secondary to some other disease like carcinoma of rectum, pregnancy, straining at micturition, or constipation due to any cause. These can be classified into external, internal or mixed (externo-internal) depending on their position in relation to anal orifice.

SALIENT FEATURES

- Many small sized haemorrhoids are asymptomatic. They present with bright red painless bleeding that can be mild or severe.
- Mucous discharge, prolapse of piles and occasionally pain can also occur, if associated with proctitis
- Chronic cases develop anaemia due to continuous blood loss.
- On the basis of clinical features, haemorrhoids can be graded:
  - First degree—bleed only, do not prolapse
  - Second degree—bleeding occurs, descend down on straining but reduce spontaneously
  - Third degree—piles prolapse during defaecation, but stay prolapsed and have to reposed manually
  - Fourth degree—piles are large and remain permanently prolapsed
- On examination, there is no external evidence of haemorrhoids in early cases. In advanced cases, haemorrhoids can be seen on straining or are constantly prolapsed.
- Complications of haemorrhoids include strangulation, thrombosis, ulceration, gangrene, fibrosis, suppuration and pylophlebitis.

Treatment

Asymptomatic haemorrhoids do not need any treatment. Secondary haemorrhoids due to concomitant disease also tend to resolve once the underlying disease is cured.

In mild degree haemorrhoids

Bowel regulation by the use of laxatives, use of high fibre diet, Sitz bath. Associated proctitis should be treated with antibiotics and metronidazole before any invasive procedure is attempted.

Persistent bleeding haemorrhoids require intervention as follows:

- First degree haemorrhoids – sclerotherapy with 5% phenol in almond oil
- Second degree haemorrhoids – Barren band ligation
- Third and fourth degree haemorrhoids – haemorrhoidectomy

The complications of surgery include pain, acute retention of urine, reactive bleeding and later on secondary haemorrhage and anal stricture.

Patient education

- Avoid constipation by using high fibre diet that produces high roughage.
- Use laxative, if required. Avoid straining during defaecation.
- Sitz bath.
- Haemorrhoids that prolapse should be reposed gently and not forced back.
- Take treatment for any disease that promotes straining at micturition like benign hypertrophy of prostate.

References

1. Benign Diseases of the Anorectum. In: Maingot's Abdominal Operations. Zinner MJ, Schwatz SI, Ellis H (eds), 10th Edition, Prentice Hall International, 1997; pp. 1437-1444.
2. The anus and the anal canal. In: Bailey and Love's Short Practice of Surgery. Russel RCG, Williams NS, Bulstrode CJK. (eds), 24th Edition, Arnold, London, 2004; pp. 956-967.

PAEDIATRIC SURGICAL CONDITIONS

Spina Bifida

Spina bifida is a congenital malformation in which there is incomplete closure of the spinal arch at one or more levels. The disorder can be diagnosed in the antenatal period with ultrasound and a decision regarding continuation of pregnancy can be taken in consultation with paediatric surgeon, obstetrician, neurosurgeon and other specialties.

SALIENT FEATURES

- Spina bifida occulta—defect is seen only on the radiographs. Some sort of cutaneous manifestation may point towards the underlying defect.
- Spina bifida aperta—meningocoele, meningomyelocoele and syringomyelocoele. This category requires immediate decision about the course of treatment after parent counselling.
- The lesions have varying degree of associated neurological deficit, musculoskeletal defects. Almost 90% cases have associated hydrocephalus.

Treatment

- If the lesion is detected on antenatal ultrasound, parent counselling should be done after investigations for other associated congenital malformations.
- If the parents opt for continuation of pregnancy, they should be referred to a centre where facilities of paediatric surgeons or neurosurgeon are available.
- If a newborn baby is seen with a defect on the back, baby should be taken for immediate surgery after relevant investigation at a centre where expert surgical expertise and operating facilities for neonatal surgery are available.

At the peripheral centre, management would include:

- Isolation of the newborn and prevention of hypothermia.
- Care of the lesion and back to prevent desiccation and trauma.

- Nursing in a prone position.
- Intravenous fluids—10% Dextrose 60 ml/kg/day for the first 48 hours of life.
- Inj. Ampicillin (500 mg/vial) 100 mg/kg in 4 divided doses.
- Transfer the baby to a tertiary care centre.

Parent education

- If diagnosed in antenatal period, parents are counselled and investigated for severity of lesion and possible outcome.
- Abortion may be advised, if associated anomalies are noted in the foetus.

Reference

1. Management of Spina Bifida, Hydrocephalus, Central Nervous System Infections and Intractable Epilepsy. In: Paediatric Surgery. O'Neill JA Jr, Rowe MI, Grosfeld JL et al (eds), 5th Edition, Mosby, St. Louis, 1998.

UNDESCENDED TESTIS

Undescended testis is defined as the testis, which cannot be brought to the base of the scrotum without undue tension on the spermatic cord. This anomaly is often diagnosed early but the treatment is delayed due to misconceptions leading to various complications.

SALIENT FEATURES

- The testis can be located in the superficial inguinal pouch, inguinal canal or intra-abdominal site. Truly ectopic testis can be present in perineum, femoral region, pubopenile site or contralateral hemiscrotum.
- Differentiate from retractile testis which is occasionally pulled up due to reflex contraction of cremasteric muscle. The retractile testis is normal in size, can be brought down into scrotum where it stays for some time and the scrotum is normally developed.
- Complications of undescended testis include temperature effects on testis, endocrine effects, germ cell alteration, lower fertility, higher incidence of malignancy, increased incidence of torsion, increased chances of trauma and psychological trauma.

Treatment

1. If the newborn child is seen with unilateral undescended testis, follow-up the patient at intervals to see the descent. If testis fails to descend by the age of 12 months, orchiopexy is advised. If seen after first birthday, the operation of orchiopexy should be done before the age of two years. The operation entails mobilizing the testis and cord structures and fixing it in the subdartos pouch in the scrotum with unabsorbable sutures.
2. If the newborn child has bilateral undescended testes with hypospadias, it should be investigated for intersex disorder.

3. If a child has undescended testis with clinically visible hernia, orchiopexy can be done at an earlier age along with herniotomy.

Patient education

- The parents should be informed about the anomaly, if detected at birth and advised to monitor the descent of testis and to get it operated by the age of 1 year.

Reference

1. Undescended Testis, Torsion and Varicocele. In: Paediatric Surgery. O'Neill JA Jr, Rowe MI, Grosfeld JL et al (eds), 5th Edition, Mosby, St. Louis, 1998.

ANORECTAL MALFORMATIONS

These are characterized by the absence of the anal opening or an abnormally located anal or rectal opening. These are evident at birth and need urgent attention on behalf of the attending physician. These can be associated with other congenital malformations like cardiac anomalies, gastrointestinal anomalies, vertebral anomalies, genitourinary system anomalies and limb anomalies.

Treatment

- Isolate the baby
- Maintain temperature
- Insert nasogastric tube to rule out oesophageal atresia and decompress stomach
- Reassure and counsel parents
- Explain prognosis

Pharmacological

It is required in all the cases that are to be undertaken for surgery in the form of definitive procedure or preliminary colostomy.

1. Intravenous fluids—10% Dextrose 60 ml/kg per day (first 48 hours) and Isolyte P 100 ml/kg body weight thereafter till required.
2. Inj. Vitamin K 1 mg IM stat
3. Inj. Ampicillin 50-100 mg/kg in 4 divided doses for 7 days.
4. Inj. Metronidazole 7.5 mg/kg per day in 3 divided doses for 3 days.

Surgical treatment

Best carried out by a qualified paediatric surgeon.

Figures 18.2 and 18.3 depict examination and management of anorectal anomalies in male and female newborns. Transfer newborns to such centres for performing the definitive surgery. However, colostomy can be performed at places where expertise for doing definitive procedure is not available.

Anovestibular fistula can be managed by cut back procedure at a peripheral centre as initial procedure. Anal stenosis can be managed by anal dilatation.

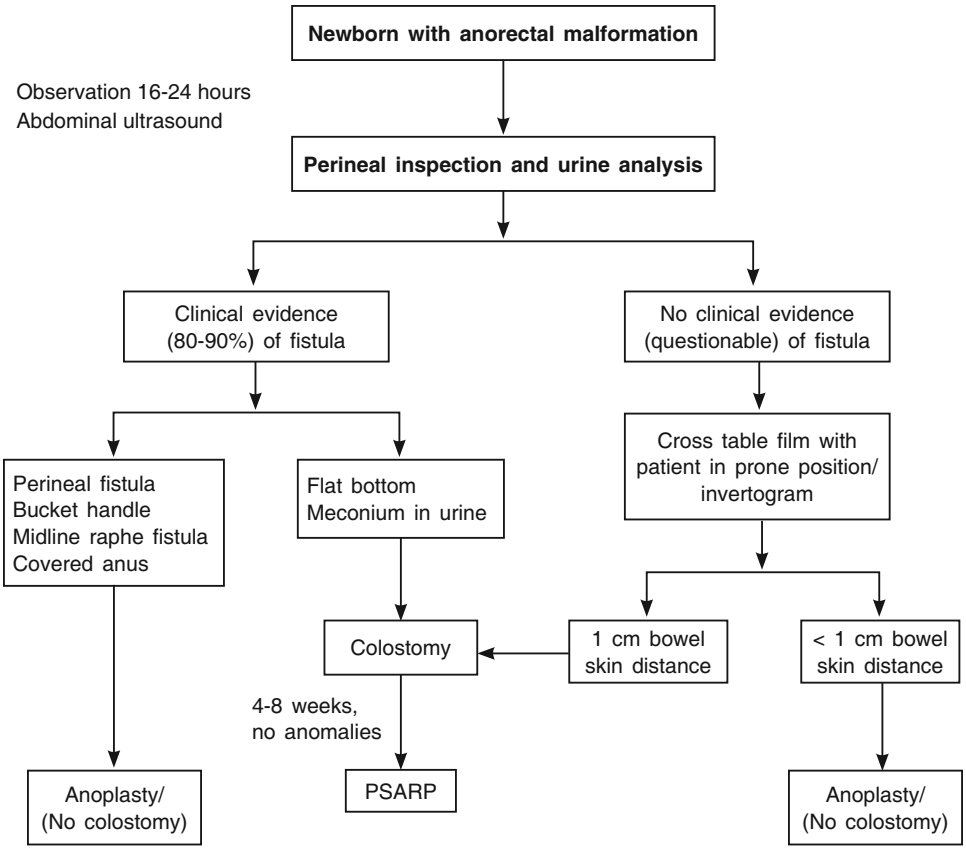


Fig. 18.2. Examination and management of anorectal anomalies in male.

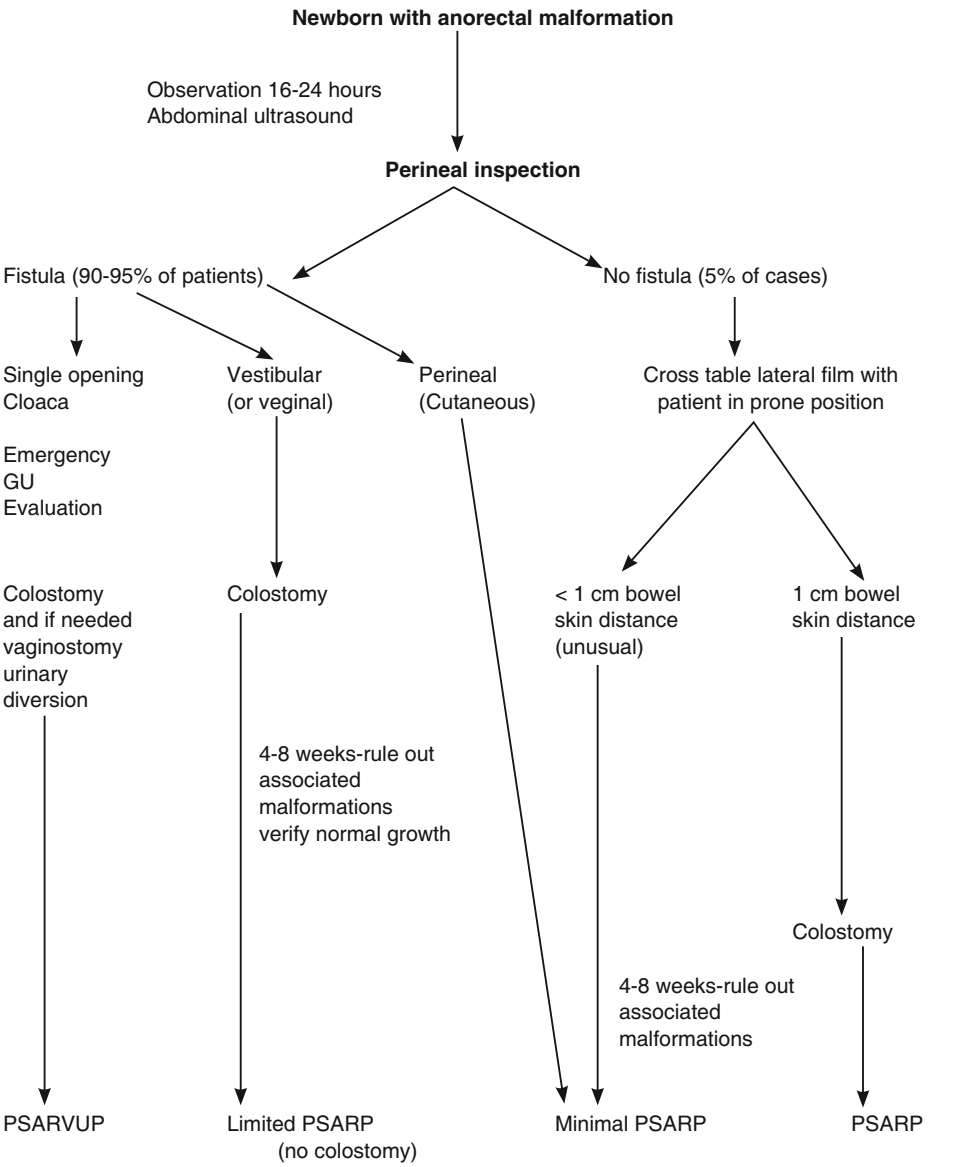
If unsure, it is safe to perform a sigmoid colostomy before referring the patient to a tertiary care centre.

Parent education

- Reassure the parents and explain the nature of anomaly and also explain that the child would require multiple surgical procedures to correct the malformation.
- Teach the parents the care of the colostomy—not leaving it open, cleaning around it with soft cotton cloth soaked in water, not rubbing over the colostomy to prevent bleeding, management of prolapsed colostomy and follow-up schedule.

Reference

1. Anorectal Malformations. In: Paediatric Surgery. O'Neill JA Jr., Rowe MI, Grosfeld JL et al (eds), 5th Edition, St. Louis, 1998.



PSARVUP—posterior sagittal non-recto-vaginourethroplasty; PSAR—psterior anoplasty; PSARP—posterior sagittal anorectoplasty.

Fig. 18.3. Examination and management of anorectal malformations in female.

CARCINOMA BREAST

Breast cancers are potentially life-threatening malignancies that develop in one or both breasts. Breast cancer is either noninvasive or invasive.

SALIENT FEATURES

- Breast cancers in their early stages usually are painless or could present as a hard lump, the affected breast appear elevated or asymmetric, the nipple may be retracted or scaly, or breast is dimpled like the skin of an orange, bloody or clear discharge from the nipple. Many cancers, however, produce no symptoms and cannot be felt on examination; they can be detected only with the use of a mammogram.
- The causes of breast cancer are not yet completely understood but certain women do seem to be at a higher risk of developing the disease—women over the age of 65, inherited faulty gene (BRCA1 and BRCA2).
- The following factors might indicate the possible presence of an inherited faulty gene within a family: breast cancer in several close members of the same family; other cancers, especially cancer of the ovary and colon; women who either have no children or had children late in life, and women whose periods started at a very young or menopause occurred late; hormone replacement therapy (HRT) slightly increases the risk of developing breast cancer. Women taking combinations of oestrogen and progesterone seem to have a greater increase in risk than women taking oestrogen alone.

Screening

1. Breast examination

Early detection of breast cancer significantly reduces the risk of death. Every woman between the ages of 20 and 49 should have a physical examination by a health professional every one to two years. Those over 50 should be examined annually.

Monthly self-examination

1. Pick a time of the month that is easy to remember and perform self-examination at that time each month. The breast has normal patterns of thickness and lumpiness that change within a monthly period, and a consistently scheduled examination will help differentiate between what is normal from abnormal.
2. Stand in front of a mirror. Breasts should be basically the same size (one may be slightly larger than the other). Check for changes or redness in the nipple area. Look for changes in the appearance of the skin. With hands on the hips, push the pelvis forward and pull the shoulders back and observe the breasts for irregularities. Repeat the observation with hands behind the head. Move each arm and shoulder forward.

3. Lie down on the back with a rolled towel under one shoulder. Apply lotion or bath oil over the breast area. The finger action should be as follows: Use the 2nd, 3rd, and 4th finger pads (not tips) held together and make dime-sized circles. Press lightly first to feel the breast area, and then press harder using a circular motion. Using this motion, start from the collar bone and move downward to underneath the breast. Shift the fingers slightly over, slightly overlapping the previously checked region, and work upward back to the collar bone. Repeat this up-and-down examination until the entire breast area has been examined. Be sure to cover the entire area from the collar bone to the bottom of the breast area and from the middle of the chest to the armpits. Move the towel under the other shoulder and repeat the procedure.
4. Examine the nipple area, by gently lifting and squeezing it and checking for discharge.
5. Repeat step 3 in an upright position. (The shower is the best place for this, using plenty of soap.)

Note: A lump can be any size or shape and can move around or remain fixed. Of special concern are specific or unusual lumps that appear to be different from the normal varying thicknesses in the breast.

2. Mammography screening

- Women with risk factors for breast cancer, including a close family member with the disease, should consider having annual mammograms starting 10 years earlier than the age at which the relative was diagnosed.
- Women over 40 years old with no special risk factors to have a baseline mammogram at age 40 and then be tested every one to two years until age 50.
- After age 50, screening should be annual (women over 65 account for most new cases of breast cancer).

3. Biopsy

- A definitive diagnosis of breast cancer made only by a excisional biopsy under general anaesthesia.

Treatment

The three major treatments of breast cancer are surgery, radiation, and combination drug therapy. No one treatment fits every patient, and some combination therapy is virtually always required. The choice is determined by many factors, including the age of the patient and (among women) menopausal status, the kind of cancer (e.g. ductal vs. lobular), its stage, and whether the tumour contains hormone-receptors or not.

Stage 0

This stage is also called noninvasive carcinoma or carcinoma in situ.

Lobular carcinoma in situ. (1) Careful monitoring with or without preventive use of tamoxifen or other selective oestrogen-receptor modulators (SERMs). (2) In selected

cases, consideration of removal of both breasts, since if the cancer does develop, it tends to do so in both breasts or to be invasive.

Ductal carcinoma in situ. Use of tamoxifen or other SERMs after surgery and radiation to prevent recurrence in selected patients.

Stage I and Stage II

Stage I. Cancer cells have not spread beyond the breast and the tumour is no more than 2 cm (about 3/4 of an inch) across.

Stage II. One of the following conditions apply: the tumour is less than 2 cm across (lumpectomy followed by radiation), and the cancer has spread to the lymph nodes under the arm; the tumour is between 2 and 5 cm (about 3/4 inch to 2 inches) with or without spreading to the lymph nodes under the arm (lumpectomy followed by radiation); the tumour is larger than 5 cm but has not spread to the lymph nodes under the arm (mastectomy).

Primary treatment options for Stage I and II breast cancers

Choice of: (1) Breast-sparing surgery (typically lumpectomy, usually with lymph node sampling) followed by external beam radiation therapy, or (2) modified or radical mastectomy with or without breast reconstruction. (3) Removal or radiation of lymph nodes.

Adjuvant and neoadjuvant treatment options. Adjuvant therapy is administered in addition to surgery or radiation therapy to prevent recurrence. (1) Combination chemotherapy can be considered for hormone receptor-negative cancers. (2) Hormonal therapy with or without chemotherapy for hormone receptor-positive cancers. Tamoxifen is the standard agent and is administered for about five years. Aromatase inhibitors (letrozole, anostrazole, and exemestane) are proving to be at least as effective as tamoxifen, although the results of these agents in the adjuvant setting are still preliminary.

Stage III (locally advanced)

In this stage, the tumour in the breast is more than 5 cm across, and it has spread (sometimes extensively) to the underarm lymph nodes, or it has spread to other lymph nodes or tissues near the breast. Inflammatory breast cancer is also treated as a Stage III cancer.

Treatment options for Stage III

(1) Standard therapy is mastectomy usually with radiation therapy and systemic treatment (combination chemotherapy, hormonal therapy, or both). (2) Radiation after surgery is recommended for women with four or more involved lymph nodes or an extensive primary tumour. It is not yet clear, if radiation would benefit women with one to three involved lymph nodes.

Stage IV (metastasized cancer)

In stage IV, the cancer has spread from the breast to other parts of the body. In about 75% of cases, the cancer has spread to the bone. The cancer at this stage is considered to be chronic and incurable and the usefulness of treatments available is limited. The goals of treatment for Stage IV can be a complete or partial response, stabilization of the disease, or slowing of its progression. Unlike many other cancers, stage IV breast cancer patients have responded to as many as five rounds of intervention drug treatments.

Treatment options for Stage IV

(1) Surgery or radiation for any localized tumours in the breast. (2) Chemotherapy, hormonal agents, or both are appropriate for most patients (durable and complete remission possible in 10 to 20% of cases but cure is very rare). Chemotherapy in patients with hormone receptor-negative disease or who have extensive metastasis, which requires rapid tumour shrinkage. Ovarian ablation (in premenopausal women) or other hormonal therapies in patients with hormone receptor-positive cancer and no or minimal organ involvement (Aromatase inhibitors, taxanes, and other agents used in combination or in innovative schedules are improving results). (3) Metastasis to the brain may require radiation and high-dose steroids. (4) Metastasis to the bone (which occurs in 75% of cases) may be helped with radiation and bisphosphonates (clodronate and pamidronate) by reducing pain and preventing fractures. Such treatments relieve pain and help prevent bone fractures.

Recurrent breast cancer

Recurrent breast cancer is considered to be an advanced cancer. Most recurrences appear within the first two or three years after treatment, but breast cancer can recur many years later. Treatment options are based on the stage at which the cancer reappears, whether the tumour is hormone responsive or not, and the age of the patient. 10 to 20% of recurring cancers are local; most are metastatic at presentation. All patients with recurring cancer are candidates for clinical trials.

Psychological support at any stage. Studies have suggested that psychotherapy, group support, or both can relieve pain and reduce stress. There is no evidence that facing the realities of the condition causes any physical deterioration.

Radiation

Radiation is generally in the following ways:

- *External beam radiation.* It is usually administered 4 to 6 weeks after surgery and delivered externally by an X-ray machine that targets radiation to the whole breast. It may be delivered to the chest wall in high-risk patients (e.g. large tumours, close surgical margins, or lymph node involvement). The treatment is generally given daily for about 6 weeks. A follow-up boost of radiation therapy in patients with lumpectomies appears to reduce the risk for recurrence.

- *Brachytherapy* (radiation delivered in implants). Implants are most often used as a radiation boost rather than as primary radiation therapy. Nevertheless, some evidences suggest that implants alone can reduce treatment time and may be as effective as external beam radiation in early stage breast cancer.

Patient education

- All breast surgery, however, will leave some type of scar, and the appearance of the breast afterwards depends on the technique used.
- Side effects of radiation include: fatigue, nausea and lack of appetite, skin changes and burns can occur on the breast skin. After repeated sessions, the skin may become moist and "weepy." Exposing the treated skin to air as much as possible helps healing.
- Chemotherapy is given as a course of treatment, which may last for less than one day or for a few days. This is followed by a rest period of a few weeks. The number of courses depends on the type of cancer and how well it is responding to the drugs.
- Chemotherapy can sometimes cause unpleasant side effects, but for women whose cancer has spread it can also make them feel better by relieving the symptoms of the cancer. The main side effects are: lowered resistance to infections, anaemia, feelings of sickness, nausea, vomiting, sore mouth, hair loss (if patient loses hair, it will grow back over a period of 3-6 months).
- Adjuvant chemotherapy is given in addition to surgery to reduce the chances of a cancer coming back. It works by killing off any tiny traces of cancer that might have been left behind after an operation and that were too small to be seen or to be picked up on scans or other tests.

Reference

1. Harris JR, Lippman ME, Morrow M, Hellman S. In: Diseases of Breast. Lippincott Raven, Philadelphia, 1996.