Treatment

Treatment

Medical treatment is very e ff ective and should be the first choice in the elective situation, with surgery being reserved for complications. Metronidazole and tinidazole are the e ff ective drugs. After treatment with metronidazole and tinidazole, diloxanide furoate, a luminal amoebicide that is not e ff ective against hepatic infestation, is used for 10 days to destroy any intestinal amoebae. Aspiration is carried out when imminent rupture of an abscess is expected, especially when involving the left lobe. Pigtail catheter drainage may be considered in those pa who are not responding to intravenous metronidazole in the first 48–72 hours to improve antibiotic penetration. If there is evidence of secondary infection, appropriate drug treatment is added. The threshold for draining a left liver lobe abscess - - should be low , given its propensity for rupture into either the peritoneal, pleural or pericardial cavity . tions Surgical treatment should be reserved for the complica of rupture into the pleural (usually the right side), peritoneal or pericardial cavities. Resuscitation, drainage and appropriate la vage with vigorous medical treatment are the key principles. In the large bowel, severe haemorrhage and toxic megacolon are rare complications. In these patients, the general principles of a surgical emergency apply , the principles of management being the same as for any toxic megacolon. Resuscitation is followed by resection of bowel with exteriorisation. Then the patient is given vigorous supportive therapy . All such cases are tients managed in the intensive care unit, as would any patient with toxic megacolon whatever the cause. An amoeboma that has not regressed after full medical treatment should be managed with colonic resection, particu - larly if cancer cannot be excluded.

Figure 6.2 Computed tomographic scan showing an amoebic liver abscess in the right lobe. Figure 6.3 Computed tomographic scans showing multiple amoebic liver abscesses with extension into the chest.

Amoebiasis: treatment /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF

Medical treatment is very effective For large abscesses, repeated aspiration or pigtail catheter drainage is combined with drug treatment Surgical treatment is reserved for complications, such as rupture into the pleural, peritoneal or pericardial cavities Acute toxic megacolon and severe haemorrhage are intestinal complications that are treated with intensive supportive therapy followed by resection and exteriorisation: subtotal colectomy with terminal ileostomy and closure of the rectal stump When an amoeboma is suspected in a colonic mass, cancer should be excluded by appropriate imaging and biopsy

Treatment

The pulmonary phase of the disease is usually self-limiting and requires symptomatic treatment only . For intestinal disease, patients should ideally be under the care of a physician for treatment

with anthelminthic drugs. Certain drugs may cause rapid death of the adult worms and, if there are many worms in the terminal ileum, the treatment may actually precipitate acute intestinal obstruction from a bolus of dead worms. Children who present with features of intermittent or subacute obstruction should be given a trial of conservative management in the form of intravenous fluids, nasogastric suction and hypertonic saline enemas. The last of these helps to disentangle the bolus of worms and also increases intestinal motility . Surgery is reserved for complications, such as intestinal obstruction that has not resolved on a conservative regime, or when perforation is suspected. At laparotomy , the bolus ms in the terminal ileum is milked through the of wor ileocaecal valve into the colon for natural passage in the

(a) (b) Figure 6.5 Ultrasound scan showing a live worm (arrow) in the gallbladder ryya, Kolkata, India). Figure 6.6 Magnetic resonance cholangiopancreatography showing a roundworm in the common bile duct (CBD). The worm could not be removed endoscopically. The patient underwent an open chole

cystectomy and exploration of the CBD (this can also be addressed laparoscopically in some centres).

(a) and the common bile duct (CBD) (b) (courtesy of Dr A Bhattacha

stool. Postoperatively , hypertonic saline enemas may help in the extrusion of the worms. Strictures, gangrenous areas or perforations need resection and anastomosis. If the bowel wall is healthy , enterotomy and removal of the worms may be performed (Figure 6.7). Rarely , when perforation occurs as a result of roundworm, the parasites may be found lying free in the peritoneal cavity . It is safer to bring out the site of perforation as an ileostomy because, in the presence of a large number of w orms, the clo sure of an anastomosis may be at risk of breakdown from the activity of the residual worms in the bowel. When a patient is operated upon as an emergency for a suspected complication of roundworm infesta tion, the actual diagnosis at operation may turn out to be acute appendicitis, typhoid perforation or a tuberculous stricture and the pr ence of roundworms is an incidental finding. Such a patient requires the appropriate surgery depending upon the primary pathology . Common bile duct or pancreatic duct obstruction from a roundw orm can be treated by endoscopic removal at endo scopic retrograde c holangiopancreatography (ERCP), failing which laparoscopic or open exploration of the common bile duct is necessary . Cholecystectomy is also carried out. A full w any surgical course of antiparasitic treatment must follo intervention. Summary box 6.5 Ascariasis: diagnosis and management /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF

Figure 6.7 (a) Roundworms seen through the bowel wall (arrowed). worms. Barium meal and follow-

through will show worms scattered in the small bowel Ultrasonography may show worms in the common bile duct and pancreatic duct Plain abdominal radiograph and contrast CT scan will show the worms as tubular or curvilinear structures Conservative management with anthelminthics is the /f_i rst line of treatment even in obstruction Surgery is a last resort for acute abdomen – various options are available (b) Roundworm being removed through enterotomy. (c) Removed round

Treatment

Praziquantel and albendazole are the drugs of choice. However, the surgeon faces a challenge when there are stones not only in the gallbladder but also in the common bile duct. Cholecystec tomy with exploration of the common bile duct is performed when indicated; currently , both procedures are performed lapa roscopically as a single-stage procedure. R epeated washouts are necessary during the exploration of the common bile duct as there are stones, biliary debris, sludge and mud in the dilated duct. This should be followed b y choledochoduodenostomy . As this is a disease with a prolonged and relapsing course, some surgeons prefer to do a choledochojejunostomy to a Roux loop. The Roux loop is brought up to the abdominal wall, referred to as ‘an access loop’, which allows the interventional radiologist to deal with any future stones. As a public health measure, people who have emigrated from an endemic area should be o ff ered screening for César Roux , 1857–1934, Professor of Surgery and Gynaecology , Lausanne, Switzerland, described this method of forming a jejunal conduit in 1908. Otto Eduard Heinrich Wucherer , 1820–1873, German physician who practised in Brazil. Joseph Bancroft , 1836–1894, English physician who worked in Australia. Peau d’orange is French for ‘orange peel skin’. hepatobiliary system. This condition can be diagnosed and treated, and even cured, when it is in its subclinical form. Most importantly , the risk of developing the dreadful disease of cholangiocarcinoma is eliminated. Summary box 6.7 Asiatic cholangiohepatitis: treatment /uni25CF - /uni25CF /uni25CF w -

Medical treatment can be curative in the early stages Surgical treatment is cholecystectomy, exploration of the common bile duct and some form of biliary–enteric bypass Prevention: consider offering hepatobiliary ultrasonography as a screening procedure to recently arrived migrants from endemic areas

Treatment

Medical treatment with diethylcarbamazine is very e ff ective in the early stages before the gross deformities of elephantiasis have developed. In the early stages of limb swelling, intermit tent pneumatic compression helps, but the treatment has to be repeated over a prolonged period. Summary box 6.8 Filariasis /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF A hydrocele is treated by the usual operation of excision and eversion of the sac with, if necessary , excision of redun - dant scrotal skin. Operations for reducing the size of the limb are hardly ever done these days because the procedures are so rarely successful.

Caused by Wuchereria bancrofti , which is carried by the mosquito Lymphatics are mainly affected,

resulting in gross limb swelling Eosinophilia occurs; immature worms may be seen in a nocturnal peripheral blood smear Gross forms of the disease cause a great deal of disability and misery Early cases are very amenable to medical treatment Intermittent pneumatic compression gives some relief The value of various surgical procedures is largely unproven and hence they are rarely performed Figure 6.9 Filariasis of the scrotum and penis (courtesy of Professor Ahmed Hassan Fahal, FRCS MD MS,

Khartoum, Sudan).

Treatment

Here, the treatment of hepatic hydatid is outlined because the liver is most commonly a ff ected, but the same general princi - ples apply whichever organ is involved. These patients should be treated in a tertiary unit where good teamwork between an expert hepatobiliary surgeon, an experienced physician and an interv entional radiologist is available. Surgical treatment by minimal access therapy is best summarised by the mnemonic PAIR (puncture, aspira - tion, injection and reaspiration). This is done after adequate drug treatment with albendazole, although praziquantel has

Figure 6.13 Magnetic resonance cholangiopancreatography showing a large hepatic hydatid cyst with daughter cysts communicating with the common bile duct, causing obstruction and dilatation of the entire biliary tree (courtesy of Dr B Agarwal, New Delhi, India).

also been used, both of these drugs being available only on a ‘named patient’ basis. Whether the patient is treated only medically or in combi nation with surgery will depend upon the clinical group (which gives an idea as to the activity of the disease), the number of cysts and their anatomical position. Radical total or partial pericystectomy with omentoplasty or hepatic segmentectomy (especially if the lesion is in a peripheral part of the liver) are some of the surgical options. During the operation, scolicidal agents ar e used, such as hypertonic saline (15–20%), ethanol (75–95%) or 5% povidone–iodine (although some use a 10% solution). This may cause sclerosing cholangitis if biliary rad icles are in communication with the cyst wall. A laparoscopic approach to these procedures is being tried (see next section, Laparoscopic management). Obviously , cysts in other organs need to be treated in accor dance with the actual anatomical site, along with the general principles described. An asymptomatic cyst tha t is inactive (group 3) may be left alone. Summary box 6.10 Hydatid cyst of the liver: treatment /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF Currently , surgeons trained in minimal access surgery perform hydatid surgery using minimal access. Laparoscopic marsupial - isation of the cyst (deroofing), consisting of removal of the cyst containing the endocyst along with daughter cysts, is the most common procedure. In the initial steps, the cyst is aspirated, taking care not to spill any contents, using povidone–iodine or hypertonic saline as a scolicidal agent. Any communication with the biliary tr ee is oversewn and pedicled omentum is sutured to the margins of the cyst. If the cyst is small and superficial, a cystopericystectomy is performed at centres experienced enough to do more advanced surger y , removing the entire cyst intact.

Figure 6.14 Computed tomographic (CT) scan of the upper abdomen showing a hypodense lesion of the left lobe of the liver; the periphery of the lesion shows a double edge. This is the lamellar membrane of the hydatid cyst that separated after trivial injury. The patient was a 14-year-old girl who developed a rash and pain in the upper abdomen after dancing. The rash settled down after a course of antihistamines. The CT scan was performed 2 weeks later for persisting upper abdominal pain. Ideally managed in a tertiary unit by a multidisciplinary team of hepatobiliary surgeon, physician and interventional radiologist Leave asymptomatic and inactive cysts alone – monitor

size by ultrasonography Active cysts should /f_i rst be treated by a full course of albendazole Several procedures are available – PAIR, pericystectomy with omentoplasty and hepatic segmentectomy; appropriate management is customised according to the particular patient and organ involved Increasingly, a laparoscopic approach is being tried

Treatment

A herbal derivative from the seeds of Hydnocarpus wightianus (Chaulmoogra) was the mainstay of treatment, with some success, until the advent of dapsone (diamino-diphenyl sulphone). Dapsone, one of the principal drugs, was a deriv - ative of prontosil red and was discovered by Domagk. This is used according to the WHO guidelines along with rifampicin and clofazimine. During treatment, the patient may develop acute manifesta tions. These are controlled with steroids. Multiple drug therapy for 12 months is the key to treatment. A team approach between an infectious diseases specialist, plastic surgeon, ophthalmologist, and hand or orthopaedic surgeon is important. Surgical treatment is indicated in advanced stages of the - disease for functional disability of limbs, cosmetic disfigure - ment of the face and visual problems. These entail major reconstructive surgery , whic h is the domain of the plastic surgeon. Surgery for deformities in the hand is aimed at returning the ability to achieve a grasp and a pinch grip. Tendon trans fers (pioneered by Brand and Tovey) are used to recreate the (a) (b) Paul Wilson Brand CBE, FRCS, 1914–2003, was born to missionary parents in Southern India, and qualified in London in 1943. He himself was a dedicated missionary who was ‘ An extraordinary gifted orthopaedic surgeon who straightened crooked hands and unravelled the riddle of leprosy .’ As a pioneer in tendon transfer techniques , he established and practised initially in New Life Center, V ellore, South India and Schie ff elin Leprosy Research Centre, Karigiri, South India. Initially he trained as a carpenter and builder and maintained that his training as a carpenter helped him in his expertise in tendon transplantation. When he was awarded the CBE, his wife, Margaret, came to know about it when she found a letter from Her Majesty’s Government informing him of the award while emptying the pockets of his trousers before they were put into the wash. He later moved to Louisiana State University , Baton Rouge, LA, where he continued his work, and finally to Seattle as Emeritus Professor of Orthopaedics at the University of Washington, Seattle, USA. Margaret Brand , alongside her husband, Paul Brand, also contributed immensely to the health of leprosy patients by concentrating on research to prevent blind ness in leprosy . She became known as ‘the woman who first helped lepers to see’. Frank Tovey OBE , 1921–2019, another English surgeon at about the same time (1951–1967), also performed extensive tendon transfers and facial and other reconstructive sur gery on patients with leprosy in southern India in the State of Mysore. In this he was helped by his wife, Winifred, who organised the physiotherapy and rehabilitation of the patients and established village diagnostic and treatment centres. function of the lumbricals that have been lost due to dam - - age to the ulnar nerve. In the foot, damage to the common peroneal nerve leads to a foot drop due to paralysis of tibialis -

Figure 6.17 Lateral view of the face showing collapse of the nasal bridge due to destruction of nasal cartilage by leprosy. Figure 6.18 Frontal view of the face showing eye changes in leprosy: paralysis of orbicularis oculi and loss of eyebrows. Figure 6.19 (a, b) Typical bilateral claw hand from leprosy due to involvement of the ulnar and median nerves. Figure 6.20 Claw toes from involvement of the posterior tibial nerve by leprosy; also note autoamputation of toes of the right foot.

anterior. If a foot-drop splint is not adequate, then once again a tendon transfer (tibialis posterior into the dorsum of the foot) will improve function. Ulcers resulting from an insensate foot should be completely debrided followed by protection with a plaster cast. The general surgeon may be called upon to treat a patient when the deformity is so advanced that amputation is required or an abscess needs drainage as an emergency . All surgical procedures obviously need to be done under antileprosy drug tr eatment. This is best achieved by a team approach. Educating patients about the dreadful sequelae of the disease so that they seek medical help ear ly is important. It is also necessary to educate the general public that patients su ff ering from the disease should not be made social outcasts. Summary box 6.14 Leprosy: treatment /uni25CF /uni25CF /uni25CF /uni25CF

Figure 6.21 Bilateral trophic ulceration of the feet due to anaesthesia of the soles resulting from leprosy; also note claw toes on the left foot. Multiple drug therapy for a year Team approach Surgical reconstruction requires the expertise of a hand surgeon, orthopaedic surgeon and plastic surgeon Education of the patient and general public should be the keystone in prevention

Treatment

The treatment is mainly medical, with exocrine support using pancreatic enzymes, treatment of diabetes with insulin and the management of malnutrition. Treatment of pain should be along the lines of the usual analgesic ladder: non-opioids, followed by weak and then strong opioids and, finally , referral to a pain clinic. Surgical treatment is necessary for intractable pain, partic - ularly when there are stones in a dilated duct. Removal of the - stones, with a side-to-side pancreaticojejunostomy to a Roux loop, is the procedure of choice . As most patients are young, pancreatic resection is only very rarely considered, and only as a last resort, when all available methods of pain relief have tion been exhausted. - Summary box 6.21 Treatment of tropical chronic pancreatitis /uni25CF /uni25CF /uni25CF

Mainly medical – pain relief, insulin for diabetes and pancreatic supplements for malnutrition Surgery is reserved for intractable pain when all other methods have been exhausted Operations are side-to-side pancreaticojejunostomy; resection in extreme cases

Treatment

This must be combined management between the physician and the surgeon. Tuberculous infection at other sites must Friedrich Neelsen , he developed the mainstay . The reader is asked to look up details of medical treatment in an appropriate source. Treatment

On completion of medical treatment, the patient’s small bowel is reimaged to look for significant strictures. If the patient has features of subacute intermittent obstruction, bowel resection, in the form of limited ileocolic resection with anastomosis between the terminal ileum and ascending colon for ileocolic hyperplastic disease, strictureplasty for single ileal stricture, bowel resection for multiple closely placed strictures or right hemicolectomy for extensive ileocolic disease precluding limited resection, is performed as deemed appropriate. The surgical principles and options in the elective patient are very similar to those for Crohn’s disease, where resections should be kept as conservative as possible. The emergency patient presents a great challenge. Such a patient is

usually from a poor socioeconomic background, hence the late presentation of acute, distal, small bow el obstruction. The patient is extremely ill from dehydration, malnutrition, anaemia and probably active pulmonary tuberculosis. Vigor - ous resuscitation should precede the operation. At laparotomy , the minimum life-saving procedure is carried out, such as a resection of diseased segment with proximal ileostomy and dis - - tal ileal or colonic mucus fistula to avoid anastomosis, w hich has a high chance of leaking in the presence of active infection and poor general condition. If, however, the general condition) . Lap - of the patient permits, a one-stage resection and anastomosis ma y rarely be performed. Thereafter, the patient should ideally be under the com bined care of the physician and surgeon for a full course of standard multidrug antitubercular chemotherapy (intensive and maintenance phases) and improvement in nutritional sta tus, which may take up to 6–12 months. T he patient who had a simple bypass procedure is reassessed and, when the disease is no longer active (as evidenced by return to normal inflamma (a) - tory markers, weight gain, negative sputum culture), an elec - tive right hemicolectomy is done to remove the blind loop. This may be supplemented with strictureplasty for short strictures - at intervals or resection of a segment with several strictures. Perforation is tr eated by thorough resuscitation followed by resection of the a ff ected segment. Anastomosis is performed, - provided it is regarded as safe to do so, when peritoneal (b)

SUBHEPATIC CAECUM Figure 6.38 (a, b) Series of a barium meal and follow-through showing strictures in the ileum, with the caecum pulled up into a subhepatic position. SUBHEPATIC CAECUM SUBHEPATIC CAECUM PULMONARY INFILTRATION Figure 6.39 Barium meal and follow-through (a) and chest radiograph (b) in a patient with extensive intestinal and pulmonary tuberculosis, showing ileal strictures with high caecum and pulmonary in /f_i ltration.

encountered; otherwise, as a first stage, resection and ileostomy are performed followed by restoration of bowel continuity as a second stage later on after a full course of antitubercular chemotherapy and improvement in nutritional status. Summary box 6.26 Tuberculosis: treatment /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF

Patients should ideally be under the combined care of a physician and surgeon Vigorous supportive and full drug treatment are mandatory in all cases Symptomatic strictures are treated by the appropriate resection, e.g. local ileocolic resection or strictureplasty or resection as an elective procedure once the disease is completely under control Acute intestinal obstruction from distal ileal stricture is treated by thorough resuscitation followed by resection with ileostomy or primary anastomosis One-stage resection and anastomosis can rarely be considered if the patient’s general condition permits Perforation is treated by appropriate local resection and anastomosis or ileostomy if the condition of the patient is very poor; this is later followed by restoration of bowel continuity after the patient has fully recovered with antitubercular chemotherapy

Treatment

Vigorous resuscitation with intravenous fluids and antibiotics in an intensive care unit gives the best chance of stabilising the patient’s condition. Metronidazole, cephalosporins and gentamicin are used in combination. Chloramphenicol, despite its potential side e ff ect of aplastic anaemia, is still used occasionally in resource-poor countries. Laparotomy is then carried out. Several surgical options are available, and the most appro priate operative procedure should be chosen judiciously

depending upon the general condition of the patient, the site of perforation, the number of perforations and the degree of (a) (b) ration (Figure 6.41) after freshening the edges, wedge resec - tion of the ulcer area and closure, resection of bowel with or without anastomosis (exteriorisation), closure of the perfo - ration and side-to-side ileotransverse anastomosis, ileostomy or colostom y where the perforated bowel is exteriorised after refashioning the edges. After closing an ileal perforation, the surgeon should look of perforation or necrotic patches in the small for other sites or lar ge bowel that might imminently perforate, and deal with them appropriately . Thorough peritoneal lavage is essential. The linea alba is closed, leaving the rest of the abdominal wound open for delayed closure, as wound infection is almost inevitable and dehiscence not uncommon. In the presence of rampant infection, laparostomy may be a good alternative. When a typhoid perforation occurs within the first week of illness, the prognosis is better than if it occurs after the second or third week because, in the early stages, the patient is less nutritionally compromised and the body’s defences are more r obust. Furthermore, the shorter the interval between diagno - sis and operation, the better the prognosis. - Summary box 6.28 Treatment of bowel perforation from typhoid /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF

Figure 6.41 (a, b) Typhoid perforation of the terminal ileum (arrow in Manage in intensive care Resuscitate and give intravenous antibiotics Laparotomy – choice of various procedures Commonest site of perforation is the terminal ileum Having found a perforation, always look for others In the very ill patient, consider some form of exteriorisation Close the peritoneum and leave the wound open for secondary closure

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Figure 6.13 Magnetic resonance cholangiopancreatography showing a large hepatic hydatid cyst with daughter cysts communicating with the common bile duct, causing obstruction and dilatation of the entire biliary tree (courtesy of Dr B Agarwal, New Delhi, India).

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containing the endocyst along with daughter cysts, is the most common procedure. In the initial steps, the cyst is aspirated, taking care not to spill any contents, using povidone–iodine or hypertonic saline as a scolicidal agent. Any communication with the biliary tr ee is oversewn and pedicled omentum is sutured to the margins of the cyst. If the cyst is small and superficial, a cystopericystectomy is performed at centres experienced enough to do more advanced surger y , removing the entire cyst intact.

Figure 6.14 Computed tomographic (CT) scan of the upper abdomen showing a hypodense lesion of the left lobe of the liver; the periphery of the lesion shows a double edge. This is the lamellar membrane of the hydatid cyst that separated after trivial injury. The patient was a 14-year-old girl who developed a rash and pain in the upper abdomen after dancing. The rash settled down after a course of antihistamines. The CT scan was performed 2 weeks later for persisting upper abdominal pain. Ideally managed in a tertiary unit by a multidisciplinary team of hepatobiliary surgeon, physician and interventional radiologist Leave asymptomatic and inactive cysts alone – monitor size by ultrasonography Active cysts should /f_i rst be treated by a full course of albendazole Several procedures are available – PAIR, pericystectomy with omentoplasty and hepatic segmentectomy; appropriate management is customised according to the particular patient and organ involved Increasingly, a laparoscopic approach is being tried

Treatment

A herbal derivative from the seeds of Hydnocarpus wightianus (Chaulmoogra) was the mainstay of treatment, with some success, until the advent of dapsone (diamino-diphenyl sulphone). Dapsone, one of the principal drugs, was a deriv - ative of prontosil red and was discovered by Domagk. This is used according to the WHO guidelines along with rifampicin and clofazimine. During treatment, the patient may develop acute manifesta tions. These are controlled with steroids. Multiple drug therapy for 12 months is the key to treatment. A team approach between an infectious diseases specialist, plastic surgeon, ophthalmologist, and hand or orthopaedic surgeon is important. Surgical treatment is indicated in advanced stages of the - disease for functional disability of limbs, cosmetic disfigure - ment of the face and visual problems. These entail major reconstructive surgery , whic h is the domain of the plastic surgeon. Surgery for deformities in the hand is aimed at returning the ability to achieve a grasp and a pinch grip. Tendon trans fers (pioneered by Brand and Tovey) are used to recreate the (a) (b) Paul Wilson Brand CBE, FRCS, 1914–2003, was born to missionary parents in Southern India, and qualified in London in 1943. He himself was a dedicated missionary who was ‘ An extraordinary gifted orthopaedic surgeon who straightened crooked hands and unravelled the riddle of leprosy .’ As a pioneer in tendon transfer techniques , he established and practised initially in New Life Center, V ellore, South India and Schie ff elin Leprosy Research Centre, Karigiri, South India. Initially he trained as a carpenter and builder and maintained that his training as a carpenter helped him in his expertise in tendon transplantation. When he was awarded the CBE, his wife, Margaret, came to know about it when she found a letter from Her Majesty’s Government informing him of the award while emptying the pockets of his trousers before they were put into the wash. He later moved to Louisiana State University , Baton Rouge, LA, where he continued his work, and finally to Seattle as Emeritus Professor of Orthopaedics at the University of Washington, Seattle, USA. Margaret Brand , alongside her husband, Paul Brand, also contributed immensely to the health of leprosy patients by concentrating on research to prevent blind ness in leprosy . She became known as ‘the woman who first helped lepers to see’. Frank

Tovey OBE , 1921–2019, another English surgeon at about the same time (1951–1967), also performed extensive tendon transfers and facial and other reconstructive sur gery on patients with leprosy in southern India in the State of Mysore. In this he was helped by his wife, Winifred, who organised the physiotherapy and rehabilitation of the patients and established village diagnostic and treatment centres. function of the lumbricals that have been lost due to dam - - age to the ulnar nerve. In the foot, damage to the common peroneal nerve leads to a foot drop due to paralysis of tibialis -

Figure 6.17 Lateral view of the face showing collapse of the nasal bridge due to destruction of nasal cartilage by leprosy. Figure 6.18 Frontal view of the face showing eye changes in leprosy: paralysis of orbicularis oculi and loss of eyebrows. Figure 6.19 (a, b) Typical bilateral claw hand from leprosy due to involvement of the ulnar and median nerves. Figure 6.20 Claw toes from involvement of the posterior tibial nerve by leprosy; also note autoamputation of toes of the right foot.

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Figure 6.21 Bilateral trophic ulceration of the feet due to anaesthesia of the soles resulting from leprosy; also note claw toes on the left foot. Multiple drug therapy for a year Team approach Surgical reconstruction requires the expertise of a hand surgeon, orthopaedic surgeon and plastic surgeon Education of the patient and general public should be the keystone in prevention

Treatment

The treatment is mainly medical, with exocrine support using pancreatic enzymes, treatment of diabetes with insulin and the management of malnutrition. Treatment of pain should be along the lines of the usual analgesic ladder: non-opioids, followed by weak and then strong opioids and, finally , referral to a pain clinic. Surgical treatment is necessary for intractable pain, partic - ularly when there are stones in a dilated duct. Removal of the - stones, with a side-to-side pancreaticojejunostomy to a Roux loop, is the procedure of choice . As most patients are young, pancreatic resection is only very rarely considered, and only as a last resort, when all available methods of pain relief have tion been exhausted. - Summary box 6.21 Treatment of tropical chronic pancreatitis /uni25CF /uni25CF /uni25CF

Mainly medical – pain relief, insulin for diabetes and pancreatic supplements for malnutrition Surgery is reserved for intractable pain when all other methods have been exhausted Operations are side-to-side pancreaticojejunostomy; resection in extreme cases

Treatment

This must be combined management between the physician and the surgeon. Tuberculous infection at other sites must Friedrich Neelsen , he developed the mainstay . The reader is asked to look up details of medical treatment in an appropriate source. Treatment

On completion of medical treatment, the patient’s small bowel is reimaged to look for significant strictures. If the patient has features of subacute intermittent obstruction, bowel resection, in the form of limited ileocolic resection with anastomosis between the terminal ileum and ascending colon for ileocolic hyperplastic disease, strictureplasty for single ileal stricture, bowel resection for multiple closely placed strictures or right hemicolectomy for extensive ileocolic disease precluding limited resection, is performed as deemed appropriate. The surgical principles and options in the elective patient are very similar to those for Crohn’s disease, where resections should be kept as conservative as possible. The emergency patient presents a great challenge. Such a patient is usually from a poor socioeconomic background, hence the late presentation of acute, distal, small bow el obstruction. The patient is extremely ill from dehydration, malnutrition, anaemia and probably active pulmonary tuberculosis. Vigor - ous resuscitation should precede the operation. At laparotomy , the minimum life-saving procedure is carried out, such as a resection of diseased segment with proximal ileostomy and dis - - tal ileal or colonic mucus fistula to avoid anastomosis, w hich has a high chance of leaking in the presence of active infection and poor general condition. If, however, the general condition) . Lap - of the patient permits, a one-stage resection and anastomosis ma y rarely be performed. Thereafter, the patient should ideally be under the com bined care of the physician and surgeon for a full course of standard multidrug antitubercular chemotherapy (intensive and maintenance phases) and improvement in nutritional sta tus, which may take up to 6–12 months. T he patient who had a simple bypass procedure is reassessed and, when the disease is no longer active (as evidenced by return to normal inflamma (a) - tory markers, weight gain, negative sputum culture), an elec - tive right hemicolectomy is done to remove the blind loop. This may be supplemented with strictureplasty for short strictures - at intervals or resection of a segment with several strictures. Perforation is tr eated by thorough resuscitation followed by resection of the a ff ected segment. Anastomosis is performed, - provided it is regarded as safe to do so, when peritoneal (b)

SUBHEPATIC CAECUM Figure 6.38 (a, b) Series of a barium meal and follow-through showing strictures in the ileum, with the caecum pulled up into a subhepatic position. SUBHEPATIC CAECUM SUBHEPATIC CAECUM PULMONARY INFILTRATION Figure 6.39 Barium meal and follow-through (a) and chest radiograph (b) in a patient with extensive intestinal and pulmonary tuberculosis, showing ileal strictures with high caecum and pulmonary in /f_i ltration.

encountered; otherwise, as a first stage, resection and ileostomy are performed followed by restoration of bowel continuity as a second stage later on after a full course of antitubercular chemotherapy and improvement in nutritional status. Summary box 6.26 Tuberculosis: treatment /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF

Patients should ideally be under the combined care of a physician and surgeon Vigorous supportive and full drug treatment are mandatory in all cases Symptomatic strictures are treated by the appropriate resection, e.g. local ileocolic resection or strictureplasty or resection as an elective

procedure once the disease is completely under control Acute intestinal obstruction from distal ileal stricture is treated by thorough resuscitation followed by resection with ileostomy or primary anastomosis One-stage resection and anastomosis can rarely be considered if the patient’s general condition permits Perforation is treated by appropriate local resection and anastomosis or ileostomy if the condition of the patient is very poor; this is later followed by restoration of bowel continuity after the patient has fully recovered with antitubercular chemotherapy

Treatment

Vigorous resuscitation with intravenous fluids and antibiotics in an intensive care unit gives the best chance of stabilising the patient’s condition. Metronidazole, cephalosporins and gentamicin are used in combination. Chloramphenicol, despite its potential side e ff ect of aplastic anaemia, is still used occasionally in resource-poor countries. Laparotomy is then carried out. Several surgical options are available, and the most appro priate operative procedure should be chosen judiciously depending upon the general condition of the patient, the site of perforation, the number of perforations and the degree of (a) (b) ration (Figure 6.41) after freshening the edges, wedge resec - tion of the ulcer area and closure, resection of bowel with or without anastomosis (exteriorisation), closure of the perfo - ration and side-to-side ileotransverse anastomosis, ileostomy or colostom y where the perforated bowel is exteriorised after refashioning the edges. After closing an ileal perforation, the surgeon should look of perforation or necrotic patches in the small for other sites or lar ge bowel that might imminently perforate, and deal with them appropriately . Thorough peritoneal lavage is essential. The linea alba is closed, leaving the rest of the abdominal wound open for delayed closure, as wound infection is almost inevitable and dehiscence not uncommon. In the presence of rampant infection, laparostomy may be a good alternative. When a typhoid perforation occurs within the first week of illness, the prognosis is better than if it occurs after the second or third week because, in the early stages, the patient is less nutritionally compromised and the body’s defences are more r obust. Furthermore, the shorter the interval between diagno - sis and operation, the better the prognosis. - Summary box 6.28 Treatment of bowel perforation from typhoid /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF

Figure 6.41 (a, b) Typhoid perforation of the terminal ileum (arrow in Manage in intensive care Resuscitate and give intravenous antibiotics Laparotomy – choice of various procedures Commonest site of perforation is the terminal ileum Having found a perforation, always look for others In the very ill patient, consider some form of exteriorisation Close the peritoneum and leave the wound open for secondary closure

Treatment

Medical treatment is very e ff ective and should be the first choice in the elective situation, with surgery being reserved for complications. Metronidazole and tinidazole are the e ff ective drugs. After treatment with metronidazole and tinidazole, diloxanide furoate, a luminal amoebicide that is not e ff ective against hepatic infestation, is used for 10 days to destroy any intestinal amoebae. Aspiration is carried out when imminent rupture of an abscess is expected, especially when involving the left lobe. Pigtail catheter drainage may be considered in those pa who are not responding to intravenous metronidazole in the first 48–72 hours to improve antibiotic penetration.

If there is evidence of secondary infection, appropriate drug treatment is added. The threshold for draining a left liver lobe abscess - - should be low , given its propensity for rupture into either the peritoneal, pleural or pericardial cavity . tions Surgical treatment should be reserved for the complica of rupture into the pleural (usually the right side), peritoneal or pericardial cavities. Resuscitation, drainage and appropriate la vage with vigorous medical treatment are the key principles. In the large bowel, severe haemorrhage and toxic megacolon are rare complications. In these patients, the general principles of a surgical emergency apply , the principles of management being the same as for any toxic megacolon. Resuscitation is followed by resection of bowel with exteriorisation. Then the patient is given vigorous supportive therapy . All such cases are tients managed in the intensive care unit, as would any patient with toxic megacolon whatever the cause. An amoeboma that has not regressed after full medical treatment should be managed with colonic resection, particu - larly if cancer cannot be excluded.

Figure 6.2 Computed tomographic scan showing an amoebic liver abscess in the right lobe. Figure 6.3 Computed tomographic scans showing multiple amoebic liver abscesses with extension into the chest.

Amoebiasis: treatment /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF

Medical treatment is very effective For large abscesses, repeated aspiration or pigtail catheter drainage is combined with drug treatment Surgical treatment is reserved for complications, such as rupture into the pleural, peritoneal or pericardial cavities Acute toxic megacolon and severe haemorrhage are intestinal complications that are treated with intensive supportive therapy followed by resection and exteriorisation: subtotal colectomy with terminal ileostomy and closure of the rectal stump When an amoeboma is suspected in a colonic mass, cancer should be excluded by appropriate imaging and biopsy

Treatment

The pulmonary phase of the disease is usually self-limiting and requires symptomatic treatment only . For intestinal disease, patients should ideally be under the care of a physician for treatment with anthelminthic drugs. Certain drugs may cause rapid death of the adult worms and, if there are many worms in the terminal ileum, the treatment may actually precipitate acute intestinal obstruction from a bolus of dead worms. Children who present with features of intermittent or subacute obstruction should be given a trial of conservative management in the form of intravenous fluids, nasogastric suction and hypertonic saline enemas. The last of these helps to disentangle the bolus of worms and also increases intestinal motility . Surgery is reserved for complications, such as intestinal obstruction that has not resolved on a conservative regime, or when perforation is suspected. At laparotomy , the bolus ms in the terminal ileum is milked through the of wor ileocaecal valve into the colon for natural passage in the

(a) (b) Figure 6.5 Ultrasound scan showing a live worm (arrow) in the gallbladder ryya, Kolkata, India). Figure 6.6 Magnetic resonance cholangiopancreatography showing a roundworm in the common bile duct (CBD). The worm could not be removed endoscopically. The patient underwent an open chole

cystectomy and exploration of the CBD (this can also be addressed laparoscopically in some centres).

(a) and the common bile duct (CBD) (b) (courtesy of Dr A

Bhattacha

stool. Postoperatively , hypertonic saline enemas may help in the extrusion of the worms. Strictures, gangrenous areas or perforations need resection and anastomosis. If the bowel wall is healthy , enterotomy and removal of the worms may be performed (Figure 6.7). Rarely , when perforation occurs as a result of roundworm, the parasites may be found lying free in the peritoneal cavity . It is safer to bring out the site of perforation as an ileostomy because, in the presence of a large number of w orms, the clo sure of an anastomosis may be at risk of breakdown from the activity of the residual worms in the bowel. When a patient is operated upon as an emergency for a suspected complication of roundworm infesta tion, the actual diagnosis at operation may turn out to be acute appendicitis, typhoid perforation or a tuberculous stricture and the pr ence of roundworms is an incidental finding. Such a patient requires the appropriate surgery depending upon the primary pathology . Common bile duct or pancreatic duct obstruction from a roundw orm can be treated by endoscopic removal at endo scopic retrograde c holangiopancreatography (ERCP), failing which laparoscopic or open exploration of the common bile duct is necessary . Cholecystectomy is also carried out. A full w any surgical course of antiparasitic treatment must follo intervention. Summary box 6.5 Ascariasis: diagnosis and management /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF

Figure 6.7 (a) Roundworms seen through the bowel wall (arrowed). worms. Barium meal and follow-through will show worms scattered in the small bowel Ultrasonography may show worms in the common bile duct and pancreatic duct Plain abdominal

radiograph and contrast CT scan will show the worms as tubular or curvilinear structures Conservative management with anthelminthics is the /f_i rst line of treatment even in obstruction Surgery is a last resort for acute abdomen – various options are available (b) Roundworm being removed through enterotomy. (c) Removed round

Treatment

Praziquantel and albendazole are the drugs of choice. However, the surgeon faces a challenge when there are stones not only in the gallbladder but also in the common bile duct. Cholecystec tomy with exploration of the common bile duct is performed when indicated; currently , both procedures are performed lapa roscopically as a single-stage procedure. R epeated washouts are necessary during the exploration of the common bile duct as there are stones, biliary debris, sludge and mud in the dilated duct. This should be followed b y choledochoduodenostomy . As this is a disease with a prolonged and relapsing course, some surgeons prefer to do a choledochojejunostomy to a Roux loop. The Roux loop is brought up to the abdominal wall, referred to as ‘an access loop’, which allows the interventional radiologist to deal with any future stones. As a public health measure, people who have emigrated from an endemic area should be o ff ered screening for César Roux , 1857–1934, Professor of Surgery and Gynaecology , Lausanne, Switzerland, described this method of forming a jejunal conduit in 1908. Otto Eduard Heinrich

Wucherer , 1820–1873, German physician who practised in Brazil. Joseph Bancroft , 1836–1894, English physician who worked in Australia. Peau d’orange is French for ‘orange peel skin’. hepatobiliary system. This condition can be diagnosed and treated, and even cured, when it is in its subclinical form. Most importantly , the risk of developing the dreadful disease of cholangiocarcinoma is eliminated. Summary box 6.7 Asiatic cholangiohepatitis: treatment /uni25CF - /uni25CF /uni25CF w -

Medical treatment can be curative in the early stages Surgical treatment is cholecystectomy, exploration of the common bile duct and some form of biliary–enteric bypass Prevention: consider offering hepatobiliary ultrasonography as a screening procedure to recently arrived migrants from endemic areas

Treatment

Medical treatment with diethylcarbamazine is very e ff ective in the early stages before the gross deformities of elephantiasis have developed. In the early stages of limb swelling, intermit tent pneumatic compression helps, but the treatment has to be repeated over a prolonged period. Summary box 6.8 Filariasis /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF A hydrocele is treated by the usual operation of excision and eversion of the sac with, if necessary , excision of redun - dant scrotal skin. Operations for reducing the size of the limb are hardly ever done these days because the procedures are so rarely successful.

Caused by Wuchereria bancrofti , which is carried by the mosquito Lymphatics are mainly affected, resulting in gross limb swelling Eosinophilia occurs; immature worms may be seen in a nocturnal peripheral blood smear Gross forms of the disease cause a great

deal of disability and misery Early cases are very amenable to medical treatment Intermittent pneumatic compression gives some relief The value of various surgical procedures is largely unproven and hence they are rarely performed Figure 6.9 Filariasis of the scrotum and penis (courtesy of Professor Ahmed Hassan Fahal, FRCS MD MS, Khartoum, Sudan).

Treatment

Here, the treatment of hepatic hydatid is outlined because the liver is most commonly a ff ected, but the same general princi - ples apply whichever organ is involved. These patients should be treated in a tertiary unit where good teamwork between an expert hepatobiliary surgeon, an experienced physician and an interv entional radiologist is available. Surgical treatment by minimal access therapy is best summarised by the mnemonic PAIR (puncture, aspira - tion, injection and reaspiration). This is done after adequate drug treatment with albendazole, although praziquantel has

Figure 6.13 Magnetic resonance cholangiopancreatography showing a large hepatic hydatid cyst with daughter cysts communicating with the common bile duct, causing obstruction and dilatation of the entire biliary tree (courtesy of Dr B Agarwal, New Delhi, India).

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On completion of medical treatment, the patient’s small bowel is reimaged to look for significant strictures. If the patient has features of subacute intermittent obstruction, bowel resection, in the form of limited ileocolic resection with anastomosis between the terminal ileum and ascending colon for ileocolic hyperplastic disease, strictureplasty for single ileal stricture, bowel resection for multiple closely placed strictures or right hemicolectomy for extensive ileocolic disease precluding limited resection, is performed as deemed appropriate. The surgical principles and options in the elective patient are very similar to those for Crohn’s disease, where resections should be kept as conservative as possible. The emergency patient presents a great challenge. Such a patient is usually from a poor socioeconomic background, hence the late presentation of acute, distal, small bow el obstruction. The patient is extremely ill from dehydration, malnutrition, anaemia and probably active pulmonary tuberculosis. Vigor - ous resuscitation should precede the operation. At laparotomy , the minimum life-saving procedure is carried out, such as a resection of diseased segment with proximal ileostomy and dis - - tal ileal or colonic mucus fistula to avoid anastomosis, w hich has a high chance of leaking in the presence of active infection and poor general condition. If, however, the general condition) . Lap - of the patient permits, a one-stage resection and anastomosis ma y rarely be performed. Thereafter, the patient should ideally be under the com bined care of the physician and surgeon for a full course of standard multidrug antitubercular chemotherapy (intensive and maintenance phases) and improvement in nutritional sta tus, which may take up to 6–12 months. T he patient who had a simple bypass procedure is reassessed and, when the disease is no longer active (as evidenced by return to normal inflamma (a) - tory markers, weight gain, negative sputum culture), an elec - tive right hemicolectomy is done to remove the blind loop. This may be supplemented with strictureplasty for short strictures - at

intervals or resection of a segment with several strictures. Perforation is tr eated by thorough resuscitation followed by resection of the a ff ected segment. Anastomosis is performed, - provided it is regarded as safe to do so, when peritoneal (b)

SUBHEPATIC CAECUM Figure 6.38 (a, b) Series of a barium meal and follow-through showing strictures in the ileum, with the caecum pulled up into a subhepatic position. SUBHEPATIC CAECUM SUBHEPATIC CAECUM PULMONARY INFILTRATION Figure 6.39 Barium meal and follow-through (a) and chest radiograph (b) in a patient with extensive intestinal and pulmonary tuberculosis, showing ileal strictures with high caecum and pulmonary in /f_i ltration.

encountered; otherwise, as a first stage, resection and ileostomy are performed followed by restoration of bowel continuity as a second stage later on after a full course of antitubercular chemotherapy and improvement in nutritional status. Summary box 6.26 Tuberculosis: treatment /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF

Patients should ideally be under the combined care of a physician and surgeon Vigorous supportive and full drug treatment are mandatory in all cases Symptomatic strictures are treated by the appropriate resection, e.g. local ileocolic resection or strictureplasty or resection as an elective procedure once the disease is completely under control Acute intestinal obstruction from distal ileal stricture is treated by thorough resuscitation followed by resection with ileostomy or primary anastomosis One-stage resection and anastomosis can rarely be considered if the patient’s general condition permits Perforation is treated by appropriate local resection and anastomosis or ileostomy if the condition of the patient is very poor; this is later followed by restoration of bowel continuity after the patient has fully recovered with antitubercular chemotherapy

Treatment

Vigorous resuscitation with intravenous fluids and antibiotics in an intensive care unit gives the best chance of stabilising the patient’s condition. Metronidazole, cephalosporins and gentamicin are used in combination. Chloramphenicol, despite its potential side e ff ect of aplastic anaemia, is still used occasionally in resource-poor countries. Laparotomy is then carried out. Several surgical options are available, and the most appro priate operative procedure should be chosen judiciously depending upon the general condition of the patient, the site of perforation, the number of perforations and the degree of (a) (b) ration (Figure 6.41) after freshening the edges, wedge resec - tion of the ulcer area and closure, resection of bowel with or without anastomosis (exteriorisation), closure of the perfo - ration and side-to-side ileotransverse anastomosis, ileostomy or colostom y where the perforated bowel is exteriorised after refashioning the edges. After closing an ileal perforation, the surgeon should look of perforation or necrotic patches in the small for other sites or lar ge bowel that might imminently perforate, and deal with them appropriately . Thorough peritoneal lavage is essential. The linea alba is closed, leaving the rest of the abdominal wound open for delayed closure, as wound infection is almost inevitable and dehiscence not uncommon. In the presence of rampant infection, laparostomy may be a good alternative. When a typhoid perforation occurs within the first week of illness, the prognosis is better than if it occurs after the second or third week because, in the early stages, the patient is less nutritionally compromised and the body’s defences are more r obust. Furthermore, the shorter the interval between diagno - sis and operation, the better the prognosis. - Summary box 6.28

Treatment of bowel perforation from typhoid /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF

Figure 6.41 (a, b) Typhoid perforation of the terminal ileum (arrow in Manage in intensive care Resuscitate and give intravenous antibiotics Laparotomy – choice of various procedures Commonest site of perforation is the terminal ileum Having found a perforation, always look for others In the very ill patient, consider some form of exteriorisation Close the peritoneum and leave the wound open for secondary closure

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