Treatment

Treatment

The rectum is examined under general anaesthetic with a finger and a sigmoidoscope. If penetrating injury is confirmed, laparotomy or laparoscopy is required. If an intraperitoneal rupture of the rectum is found, the perforation is closed with sutures and the rectum defunctioned with a stoma. The defunctioned distal segment should be irrigated to remove all residual faecal matter. In the event that the rectal injury cannot be repaired, a Hartmann's procedure may be needed. If the rectal injury is below the peritoneal reflection, wide drainage from below is indicated, with rectal washout and a defunctioning colostomy . Care must be taken to preserve or Henri Albert Hartmann , 1860–1952, Chief of Surgery , Hôtel Dieu, Paris, France. restore anal sphincter integrity during debridement of the perineal wounds. Antibiotic cover must be provided against both aerobic and anaerobic organisms.

Figure 79.5 Foreign body in the rectum as seen on plain abdominal radiograph.

Treatment

Surgical excision of the tumour is the conventional treatment, provided this can be achieved with clear oncological margins and acceptable risk of morbidity and mortality . However, the management of rectal cancer has become increasingly complex because of the various surgical techniques available and the range of neoadjuvant and adjuvant options. Before treatment can be planned, it is necessary to assess both the fitness of the patient and the extent of spread of the tumour. The management needs to be discussed within a multidisciplinary team (MDT) setting involving surgeons, radiologists, oncologists, pathologists and specialty nurses. It is particularly important that the recommendation be documented and discussed with the patient. The ultimate treatment decision is made jointly with the patient, taking their wishes and expectations fully into account. Principles of surgical treatment Radical excision of the rectum, together with the mesorectum and associated lymph nodes, should be the aim in most cases. In the presence of widespread metastases, other means of palliation should be considered, such as endoluminal stenting or external beam radiotherapy , although there may still be a role for palliative resection. The presence of liver metastases does not necessarily rule out the feasibility of cure: the results of surgery for liver metastases have greatly improved, with long-term survival being achieved in over a third of patients (see Chapter 69). When a tumour appears to be locally advanced (i.e. invading a neighbouring structure or threatening to breach the circumferential resection margin), the use of neoadjuvant Angelita Habr-Gama , b. 1934, surgeon, Sao Paolo, Brazil. (preoperative) radiotherapy or chemoradiotherap y is usually considered. Long-course chemoradiotherapy is given as five fractions of radiotherapy combined with chemotherapy over a 6-week period. The aim is to downstage the cancer and increase the chances of a complete r esection with clear oncological margins. Alternatively , preoperative 'short-course' (5 days) radiotherapy can be used if the resection margins are not threatened but the cancer is still at high risk for local recurrence (e.g.

perirectal lymph node involvement). Approximately 20% of rectal cancers treated by neo- adjuvant chemoradiotherapy show a complete clinical response with no evidence of residual cancer on clinical examination, biopsy or radiological imaging. There is an increasing trend for such patients to be o ff er ed the option of ‘watch and wait’ (Habr-Gama) in the hope that they may have been cured of the disease and spared the morbidity of resectional surgery . Some 30% of cases will recur on a ‘watch-and-wait’ policy , but most can be salvaged by surgical resection (Figures 79.20 and 79.21). There is also growing enthusiasm for ‘organ-preserving’ surgical techniques in early T1 and even T2 cancers with good prognostic features. This usually involves full-thickness exci- sion of the cancer using TEMS (Figure 79.22). Alternative ‘organ-preserving’ techniques involve the use of brachytherapy and contact radiotherapy , but these are currently reserved for patients unfit for radical resection or as a means of palliation. When radical excision is possible, the aim should be to restore gastrointestinal continuity and continence by preserv- ing the anal sphincter whenever feasible. A sphincter-saving operation (anterior resection) is usually possible for tumour s whose lower margin is ≥ 2 /uni00A0 cm above the anorectal junction. Although in the past removal of the rectum and anus with a permanent colostomy (abdominoperineal excision) was often required for tumours, the introduction of the stapled anasto- mosis and chemoradiotherapy downstaging has enabled many more patients to be treated by a sphincter-saving procedure. The principles of anterior resection involve radical excision of the cancer along with its complete mesorectal the inferior envelope, combined with high proximal ligation of mesenteric lymphovascular pedicle. Once the left colon and rectum have been mobilised, the distal rectum is divided at least 1 /uni00A0 cm (and preferably more) below the distal cancer margin and the specimen removed. Rectosigmoid cancers and those in the upper third of the rectum are removed by ‘high anterior resection’, in which the rectum and mesorectum are taken to a margin of at least 3 /uni00A0 cm distal to the tumour and a colorectal anastomosis is performed. For tumours in the middle and RJ (Bill) Heald , contemporary , surgeon, Basingstoke, UK, and Champalimaud Foundation, Lisbon, Portugal. lower thirds of the rectum, complete removal of the rectum and mesorectum is required, i.e. TME (Heald). Restoration of continuity is usually performed using a stapling technique, which might involve an end-to-end, side-to-end or colopouc h construction in low cancers (Figure 79.23). The retention of at least a part of the rectum in high anterior resection results in better postoperative function, with less risk of anterior resection syndrome, a condition characterised by defecatory urgency , incontinence and incomplete evacuation, secondary to removal of the normal rectal reservoir. In cancers situated below the peritoneal reflection it is usual practice to defunction the anastomosis with a temporary stoma because of the higher risk of anastomotic leak. Although a defunctioning stoma does not prevent anastomotic leak, it does mitigate against septic complications should a leak occur.

Figure 79.20 T2-weighted magnetic resonance images showing complete response to

chemoradiotherapy in a T3 rectosigmoid cancer involv ing the circumferential resection margin (arrows). Axial images before structure and only minimal extramural /f_i brosis in place of the large tumour (courtesy of Dr Damian Tolan, St James's Hospital, Leeds, UK). Figure 79.21 Endoscopic view of rectal cancer showing complete response after neoadjuvant chemoradiotherapy. Endoscopic view the time of diagnosis. Following neoadjuvant treatment (b) with the site of a tattoo only visible (courtesy of

Julian Hance, St James’s Hospital, Leeds, /uni00A0 UK).

(a) and after (b) treatment showing normalisation of the rectal wall layer (a) at

(b) Summary box 79.11 Surgery for rectal cancer /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF (b) Preoperative preparation The bowel is usually prepared by mechanical cleansing using a combination of diet, purgatives and enemas to reduce intra - operative contamination and the risk of surgical site infection. While this approach has been used selectively , recent guidelines recommend preoperative bowel preparation.

Figure 79.22 Transanal endoscopic microsurgery. (a) An operating sigmoidoscope is inserted through the anal canal to visualise the lesion and enable passage of a laparoscope and instruments. full-thickness local excision is performed. The defect is closed or, alternatively, may be left open if the peritoneum is not breached. Surgery is the mainstay of curative therapy The primary resection consists of rectal resection performed by TME Early cancers (stages T1 and selected T2) may be suitable for local excision Most cases can be treated by anterior resection, with a colorectal or coloanal anastomosis being achieved with a circular stapling device Low, extensive tumours require an abdominoperineal excision with a permanent colostomy Neoadjuvant chemoradiotherapy can be used to downstage the cancer and reduce local recurrence ‘Watch and wait’ non-operative management is an option for the 20% who have a complete clinical response to neoadjuvant chemoradiotherapy (b) A Figure 79.23 Low anterior resection by the double stapling method. The rectum has been excised and the distal anorectal stump has been transected with a transverse stapling device. A circular stapling device is used to construct either (a) a straight low coloanal anastomosis or (b) a colopouch–anal anastomosis.

operatively to reduce the risk of surgical site infection. In Europe, this usually takes the form of broad-spectrum anti- biotics given intravenously at induction of anaesthesia. In the USA, antibiotic prophylaxis is more frequently administered as a course of oral antibiotics (neomycin and metronidazole) given preoperatively in addition to intravenous antibiotics at the induction of anaesthesia. There is evidence to suggest that this may reduce the risk of septic complications, including anastomotic leak. All patients should be seen by a stoma care nurse preoper- atively and be sited for a temporary or permanent ileostomy and/or colostomy . They must also be counselled as to the com- plications of the procedure, and particularly about the risks of pelvic autonomic nerve damage causing bladder and sexual disturbance, especially impotence in males. Summary box 79.12 Preoperative preparation /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF Local operations Early rectal cancers (T1 and good prognosis T2) may be amena- ble to local transanal excision, preserving much of the rectal reservoir and therefore near normal function. Histological analysis of the specimen is then used to assess the adequacy of excision with respect to the probability of positive lymph nodes being left behind. This may range from 10% in T1 cancers to 20% in T2 cancers and clinical judgement, along with in-depth conversation with the patient, is required to determine whether local excision has achieved a su ffi cient chance of oncological cure

or whether a further radical resection is required. Local excision is usually performed with one of the com- mercially available transanal laparoscopic systems or with equipment modified from transanal total mesorectal excision (taTME) procedures (see Transanal total mesorectal exci sion). A full-thickness ex cision of the lesion is performed and the defect closed with sutures or else left open. There is a limit to the height of lesion that can be resected, with more proximal lesions in the upper rectum being di ffi cult. Anterior resection There has been a move to extend sphincter-saving operations to treat most tumours of the middle and lower thirds of the rectum, thus reducing the abdominoperineal excision rate and the need for permanent colostomy . There is also an increasing trend to use laparoscopic techniques for anterior resection, with patient benefits including less pain, quicker recovery from surgery and improved cosmesis. The evidence suggests that laparoscopic anterior resection is as safe as open surgery in terms of short- and long-term complications and oncological with the da Vinci robotic surgical system (Intuitive Surgical Inc., Sunnyvale, CA, USA) (Figure 79.24). Although this adds significant cost to the procedure, there may be some benefit in terms of a reduced need to convert to open surgery , and -

Counselling and siting of stomas Correction of anaemia and electrolyte disturbance Type and screen for blood transfusion Bowel preparation Deep vein thrombosis prophylaxis Prophylactic antibiotics (a) (b) Figure 79.24 da Vinci Xi Robotic Surgical System: (a) surgeon con

sole; (b) patient cart. (Reproduced with kind permission from Intuitive Surgical Inc. https://www.intuitive.com/en-us/products-and-services/ da-vinci/systems/.)

approach. The operation performed is the same whether the procedure is undertaken by open, laparoscopic or robotic surgery , with the di ff erence being in the extent of abdominal access trauma (laparotomy wound versus ‘keyhole’ incisions). In open surgery , a midline abdominal incision is made and full laparotomy performed to detect synchronous pathologies, including evidence of intra-abdominal cancer spread. The sigmoid and descending colon are freed by dividing the peritoneal reflection on the left side and then mobilising them to the midline on their mesentery , protecting the left ureter and testicular/ovarian vessels. The splenic flexure is mobilised to gain su ffi cient left colonic length to allow tension-free colorectal anastomosis. Rectal dissection is performed in the embryological planes (TME) with preservation of the autonomic nerves, which course over the pelvic brim (sympathetic nerves) and exit from the pelvic plexuses (parasympathetic nerves) to supply the pelvic floor and the urogenital organs (Figure 79.25 Once rectal dissection has reached the anorectal junction (low anterior resection), or at least 3 /uni00A0 cm below the cancer (high anterior resection), the rectum is divided, usually with the aid of a stapling device. The mesocolon is divided at the site of the proposed division of the colon and the trunk of the inferior mesenteric artery is ligated and divided at its origin from the aorta (high tie). Resection of the specimen is completed by division of the bo wel at the point to be used for the proximal anastomosis. Restoration of bowel continuity is usually achieved by means of a stapled anastomosis. The simplest way of achieving this is by using a ‘double stapling’ technique, whereby a circular stapling device (Figur e 79.23) is passed transanally to anastomose the stapled ends of the proximal colon and rectal stump. Alternatively , a ‘single stapled’ anastomosis may be performed in which purse-string sutures are applied to the proximal colon and rectal stump and anastomosed using a single firing of a circular stapling device inserted transanally . In cases where the anastomosis is very low (coloanal anastomosis) it may be necessary to perform a hand-sewn anastomosis. Laparoscopic and robotic anterior resection follow the above general principles, but with abdominal access through the use of four or five abdominal ports and carbon dioxide pneumoperitoneum. The dissection usually follows a medial- to-lateral approach, i.e . dissection and high ligation of the vascular pedicle followed by lateral mobilisation of the colon, then rectal resection. A small laparotomy wound is still required to extract the specimen, unless transanal specimen extraction is possible, and restoration of bowel continuity is performed by the usual stapling techniques. Transanal total mesorectal excision taTME builds on the principles of laparoscopic surgery , with an airtight anal device used to provide transanal insu ffl ation and access for laparoscopic instruments. The operation proceeds by placing a purse-string suture below the distal level of the tumour and incising the bowel wall to enter the mesorectal plane. Dissection then proceeds using a ‘bottom-up’ approach to accomplish TME. It is usual for this procedure to be undertaken as a combined operation, with synchronous ‘top-down’ laparoscopic resection by an abdominal operator Prostate Vesicle Neurovascular bundle denonvilliers’ Denonvilliers’ fascia fascia). The ‘holy plane’ who mobilises the left colon, takes down the splenic flexure and does some of the upper rectal dissection. Initial results have demonstrated that taTME is safe, with short-term oncological outcomes, in terms of pathological quality of the resection specimen and circumferential resec - tion margins, comparable to those of traditional laparoscopic and open techniques . However, concerns have been raised regarding the increased incidence of urethral injuries and the development of multifocal local recurrences. These concerns highlight the critical importance of adequate taTME training, proper case selection, and proctorship with maintenance of high procedural volumes in an MDT setting to help ensure optimal outcomes. Meanwhile, several multicentre randomised controlled trials such as COLOR III and TaLaR are well under way to confirm the long-term oncological safety of taTME. Hartmann’s operation This is an option in elderly

and frail patients in whom there is concern about poor anal sphincter function and postoperative incontinence or the viability of an anastomosis. Colorectal excision follows the same principles as outlined above, but the rectal stump is stapled closed and the proximal colon exterior - ised as a permanent end-colostomy . Abdominoperineal excision of the rectum This operation is still required for some tumours of the lower third of the rectum that are unsuitable for a sphincter-saving

Figure 79.25 Plane of dissection for total mesorectal excision in a male with midrectal cancer. (Reproduced with permission from O'Connell PR, Madoff RD, Solomon MJ (eds). Operative surgery of the colon, rectum and anus , 6th edn. Boca Raton, FL: CRC Press, 2015.)

procedure. Traditionally , the procedure was performed by two surgeons operating simultaneously , one via the abdomen and the other via the perineum, with the patient in the Trendelenburg lithotomy position. More recently , there has been a shift to completing the abdominal procedure first (with the patient in the Lloyd-Davies position, in which the legs are in supports set lower than the lithotomy position), and then placing the patient either in a prone jack-knife or Lloyd-Davies position and completing the operation via the perineum. The aim is to produce a complete resection of the rectum and mesorectum along with cylindrical excision of the extralevator component. This achieves wide excision at the level of the pelvic floor, increasing complete resection rates and reducing local perforation and the risk of local recurrence. The abdominal procedure is carried out laparoscopically or via a midline laparotomy and is performed in the same way as an anterior resection, except that dissection stops before the pelvic floor is reached (at the lev el of the seminal vesicles in men or the cervix in women) to avoid 'coning down' onto the tumour at the level of the pelvic floor. Perineal dissection is achieved through a circumanal incision, which is deepened into the ischiorectal fossae and out towards the attachment of the levator muscles to the pelvic side wall (Figure 79.26 dissection is extended posteriorly by incising Waldeyer's fascia, which is a thick condensation of pelvic fascia lying between the rectum and the sacrum. Some surgeons routinely remove the coccyx to improve access and surgical margins. Anteriorly , the plane between the rectum and the prostate in the male or between the rectum and the vagina in the female is developed, with particular care to avoid the membranous urethra in the male. A catheter within it should be palpated so that it can be avoided. Friedrich Trendelenburg , 1844–1924, Professor of Surgery , successively at Rostock (1875–1882), Bonn (1882–1895) and Leipzig (1895–1911), Germany . The Trendelenburg position was first described in 1885. Oswald Vaughan Lloyd-Davies , 1905–1987, surgeon, St Mark's Hospital, London, UK. rectum if an advanced anterior tumour is present. Resection is completed when the perineal dissection reaches the abdominal dissection, with the specimen retrieved through the perineal med in the left iliac fossa and wound. An end-colostomy is f or the wounds closed with drains to the pelvis.

Figure 79.26 Separation and division of the pubococcygeus and puborectalis muscles in the course of the perineal phase of an abdom inoperineal excision of the rectum. (Reproduced with permission from O'Connell PR, Madoff RD, Solomon MJ (eds). Operative surgery of the colon, rectum and anus , 6th edn. Boca Raton, FL: CRC Press, 2015.)

Revision #1
Created 2025-12-31 15:28:37 UTC by Omar Ayman
Updated 2025-12-31 15:28:37 UTC by Omar Ayman