Endoscopic palliation of colorectal cancer

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G NUSKO, C ELL. Endoscopic palliation of colorectal cancer. Can J Gastroenterol 1993;7(6):466-470. Palliating colorectal cancer by endoscopy means palliating rectosigmoidal cancer. Surgical palliation is preferred in tumour stenosis located higher than the first third of the sigma or distal rectum with infiltration of the anal and perianal region. Indications for endoscopic palliation are limited to incurable rectosigmoid tumours with multiple metastases, for general inoperability or in recurrent anastomotic cancers. There are several methods currently available for local palliative therapy. Cryotherapy is obsolete because of the acute and late bleeding risks from the base of the tumour. Electrocoagulation is feasible, however, time-consuming using the monopolar method. If the tumour is highly stenotic, auxiliary techniques consisting of prelaser bouginage or balloon dilation are useful. Combination therapies with intraluminal high dose irradiation or metal stents seem to be promising, according to a few case reports. At the present time, endoscopic laser therapy is the most established palliative treatment for colorectal cancers. Standard is the solid state neodymium:YAG laser. Contact laser therapy with sapphire tips or bare fibre has the advantage that no gas insufflation is required. This makes the procedure more comfortable for the patient. On the other hand, these techniques are more time-consuming than the noncontact laser irradiation. Laser therapy can be performed as an out-patient procedure. The success rate of more than 90% can be achieved with a very low complication rate of about 5%.

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Cancers of the colon and rectum are among the leading causes of morbidity and mortality in the Western world. In the United States, 150,000 cases were diagnosed in 1989 (500,000 cases worldwide), with an overall mortality of 50% (1). The incidence of colorectal cancer is increasing. The lifetime risk of developing colorectal cancer between the ages of 50 and 75 years in the United States is approximately 5%, with a 2.5% chance of dying from it (1). The median age of diagnosis is 71 years and the risk increases with age (2). The standard treatment for cancer of the large bowel is surgical removal. Extended disease or recurrent disease is unlikely to be treatable except by palliation. Patients with advanced colorectal cancer should also undergo palliative resection whenever possible because resection decreases pelvic complications, ie, pelvic abscesses, sepsis and pelvic pain (3). The purpose of palliative treatment is to relieve symptoms, to prevent obstruction and to improve the patient's quality of life.

A nonsurgical palliative treatment is indicated if the general condition of the patient does not allow surgery; in patients with nonresectable tumours, associated with high surgical mortality.
d'une endoscopie palliative se limitent aux tumeurs rectosigmoidiennes avec métagastases multiples, dans les cas généralement inopérables ou dans les cas de cancer anastomosés inopérables. Diverses techniques sont offertes à l'heure actuelle en traitement palliatif. La cryothérapie est dépassée à cause des risques aigus et tardifs d'hémorragie de la base de la tumeur. L'électrocoagulation est faisable, mais elle requiert beaucoup de temps par la méthode monopolaire. Si la tumeur est très sténosée, les techniques auxiliaires de bougirage par laser ou de dilatation par ballonnet sont utiles. Les traitements d'association avec irradiation transépicolienne à dose élevée ou extenseurs métalliques semblent être des méthodes prometteuses, selon quelques rapports de cas. Présentement, le traitement endoscopique au laser est le traitement palliatif le mieux établi pour les cancers rectocociques. La norme se base sur le laser Nd-YAG. Le traitement par contact laser avec pointes de saphir ou fibre nue a l'avantage qu'aucune insufflation de gaz n'est nécessaire. Cela rend l'intervention plus confortable pour le patient. Par contre, ces techniques requièrent plus de temps que l'irradiation au laser sans contact. Le traitement au laser peut s'effectuer en externe. Le taux de réussite peut atteindre 90 % avec un taux de complication d'environ 5 %.

rate of between 25 and 36%; and in patients refusing colostomy (4). A further indication may be seen in stenosing nonresectable recurrent cancer in the rectum. There are different methods currently available for local, nonsurgical palliative therapy.

**ELECTROCOAGULATION**

Electrocoagulation has been in use for several decades for curative or palliative treatment. Endoscopically, a snare or loop electrode can be used to cut out electrodesection of the tumour. Using cutting or blended current, the tumour is scrapped away step by step and the resulting defect is coagulated. The coagulating current can be used in two ways: to fulgurate the tumour when sparks are created between the electrode and the tumour; or to boil the tumour, when the current is used at a lower setting, the thermal damage is more limited and better visual control can be exerted. The technique must be reserved for treatment of exophytic tumours lying below the peritoneal reflection because of complicating perforation. A general or regional anesthesia is necessary. The complication rate in several recent studies varies between 8 and 28%. The main complications reported are hemorrhage, perforation, rectovaginal or rectovesical fistulas, rectal strictures and perianal absceses (5,6) with a mortality rate of 2.7%. Satisfactory palliation was achieved in about 77 to 94%.

Contamination of the tip of the probe by coagulation and charred material, and adherence to the tissue have been eliminated by the electro-hydrothermo principle (EHT), which employs water instillation at the tip of the electrode, simultaneously with the coagulation. This method, already proven as a hemostatic technique, is also suitable for tissue destruction by means of high frequency currents. It was found that the depth of penetration into the tissue at a given laser setting could also be achieved with modulated high frequency current (7). For palliative destruction, high frequency current (coagulation current) appears to be as suitable as the far more expensive laser treatment. However, experience with monopolar electrocoagulation revealed that it takes too much time to remove larger tumour masses in contrast to laser photocoagulation.

**UROLOGICAL RETROSCOPE**

Urological resectoscope has been used for palliative local treatment of rectal tumours. The advantages claimed by the users of this technique (8) compared with conventional electrocoagulation are a better view of the operation field by the continuous fluid irrigation and no need of anesthesia. The average operating time is 25 mins. In a series of 15 patients there was good palliation of constipation, bleeding and tenesmus in 12 patients ranging from three to six months. There were two postoperative complications, one intestinal perforation and an embolic stroke. No other complications were reported, such as sepsis, bleeding, incontinence, abscess or stricture (8).

**CRYOTHERAPY**

Cryotherapy has been used only as a palliative method for local treatment, in contrast to electrocoagulation. A closed system with liquid nitrogen is employed. The temperature of the probe tip is about -160°C to -185°C. By measuring temperature, the boundaries of complete tissue destruction is reached in a distance of 4 to 8 mm (9). Cryotherapy is endoscopically easy to apply and does not require general anesthesia. Although it causes little postoperative pain, a rectal discharge due to sloughing of the necrotic tissue for a period of about two weeks is reported.

The technical advantage of cryotherapy compared with electrocoagulation is the absence of smoke obscuring the view during treatment. Cryotherapy is an out-patient treatment. A complication rate of 10 to 42% has been reported (10,11). Complications include hemorrhage, perforation, fistulas and rectal strictures. The complication rate can be reduced by treating only exophytic tumours lying below the peritoneal reflection. Relief of symptoms is achieved in about 70 to 90% of patients.

**SCLEROTHERAPY**

Polidocanol solutions have been used in the treatment of esophageal and lower limb varices by interrupting the circulation in the venous vessels. Intratumoral injection of polidocanol was first employed for the treatment of esophageal carcinoma (12). In a small series of five inoperable patients with advanced rectal tumour remission of the obstructive symptoms was observed after intratumoral injection of 10 to 25 mL 3% polidocanol. None of them required colostomy. No complications occurred following sclerotherapy, but one patient experienced a hypertensive crisis. Sclerotherapy can be performed safely as an out-patient procedure in any endoscopic department with a very simple and inexpensive set-up yielding satisfactory results (13).
A series of 31 patients was treated by endocavitary irradiation for palliation (Figure 1). The results of this study showed that good local control of tumour growth was obtained in 68% of cases. Together with external irradiation, the usual dose rate is 900 to 1000 rad tumour dose per week for a large volume of tissue. Using the endocavitary method, 3000 rad is delivered to a small area in 3 mins every other week. Using this fractionation, generally moderately resistant adenocarcinomas become radiosensitive. At 1 cm depth the dose is 35%, and at 2 cm depth the dose is 14%. There appears to be very little morbidity from this type of therapy. Lesions situated within the first few centimetres of the anal verge seem to have an increased risk of morbidity. Minor superficial necrosis has been experienced by 23% of patients, and bleeding about one year after treatment due to teleangiectasia by 7%. All patients were treated on an out-patient basis (14). A further series of 64 patients with extensive adenocarcinoma of the lower third of the rectum were treated by external beam 60 cobalt irradiation followed by intracavitary and 192 iridium implant after a two month interval. After three years the local tumour control rate was 79.5% and survival was 83% (15,16).

**TRANSENDOSCOPIC BALLOON DILATION**

Transendoscopic balloon dilation of partially obstructing tumours as an adjuvant to laser phototherapy has been reported. Even in complete obstruction successful balloon dilation and temporary recanalization of the bowel lumen in three patients allowed a washout of bowel content and relief from distension so that single stage operations or retrograde endoscopic laser palliation in a cleaned gut could be performed (17). The balloon is centred within the lesion and inflated for 3 mins by filling to the recommended distension pressure as indicated by a manometer. Balloon dilation is unlikely to be successful in patients with sharply angulated or scirrhous tumours. Obstructing lesions of the distal and mid-third of the rectum can be treated also with conventional bougies – as used for the upper gastrointestinal tract.

**RECTOSIGMOID STENTS**

There are a few case reports dealing with proctoscopically placed rectosigmoid stents in treating obstructing rectosigmoid neoplasms in patients not suitable for surgery. This seems to be a new promising technique (18,19), but larger series have to prove success rates and complications. Similar to the upper gastrointestinal tract stents, obstruction by stool masses or recurrent tumour infiltration has to be expected (20).

**PHOTODYNAMIC THERAPY**

Photodynamic therapy is based on the systemic administration of a photosensitizer which is preferentially retained in malignant tissues. When the sensitized tissue is exposed to light, cytotoxic compounds are produced. Photodynamic therapy has been shown to be a safe method and can completely eradicate some small colorectal cancers (21,22). However, the limitations in the depth of light penetration, even with high energy lasers, will most likely limit the usefulness of this modality in advanced disease (23,24).

Patients unsuitable for surgery with advanced cancers of the rectum and distal sigmoid colon that are causing symptoms from the intraluminal bulk of tumour are good candidates for laser therapy. Using the neodymium (Nd): YAG laser at high power (50 to 90 W) with the fibre held 5 to 10 mm above the target tissue, neoplastic areas can be vaporized or just coagulated, and the necrotic areas allowed to slough (25). Coagulating the tumour tissue seems to be safer, but it requires more endoscopies as less bulk can be destroyed during each treatment. If the tumour stenosis can be passed endoscopically, laser therapy should be started at the proximal margin of tumour (Figure 2). The irradiation should be continued in a circular 'paint brush' fashion down to the distal tumour margin. If the stenosis is very tight and does not allow the passage of an endoscope, prelaser dilation or bougienage should be performed before laser therapy is started (Figure
3). An alternative technique is the use of the laser-resistant guide probe as shown in Figures 4 and 5. Another approach is the use of sapphire-tipped fibres or bare fibres, which are used in contact with the tissue at a much lower laser power setting (10 to 15 W) (26). They have the advantage of not requiring coaxial gas to cool the tip, which may make the procedure more comfortable; however, repeated endoscopy is necessary. In a randomized study, Nd:YAG laser therapy by the endoscopic contact low power method was compared with the noncontact high power method for palliation in colorectal cancers (27). Contact laser therapy was tolerated better by the patients and was especially suitable for lesions that are difficult to treat from a distance. No smoke generation and no risk of damage to endoscopes are other advantages. The disadvantages of contact laser treatment are the lack of visual control over therapy, possible damage to healthy tissue, adhesion, a higher cost and length of procedure. Comparing therapeutic effectiveness in a randomized study of a coaxial fibre versus a bare fibre for endoscopic Nd:YAG laser therapy of rectal tumours revealed no significant differences (28). Another technique that has been promising in experimental studies is interstitial hyperthermia. In this approach the tip of a bare laser fibre is directly inserted into the target tissue using the laser at even lower power (1 to 2 W) to get precise local coagulation (29).

The immediate success rate of laser therapy in palliation for advanced rectosigmoid cancers was up to 90% in patients with distressing symptoms from intraluminal tumour bulk affected by the circumferential extension (30). Patients with smaller tumours were more likely to experience relief from symptoms than patients with large tumours (31). The benefits from laser treatment appear to more for patients with bleeding (90 to 100%) than with obstruction (70 to 80%) (3,7,13). The duration of response is limited. Some authors carry out regular follow-up sigmoidoscopy at four to 10 week intervals with further laser therapy as necessary. Other investigators suggest to wait for symptoms to recur. In these studies, an average treatment interval of about 4.5 months has been recorded (27,32).

Complications caused by laser treatment, such as bleeding, fistulas, perforation and abscesses, were reported in 4 to 19% of patients (33-35). The overall mortality for purely palliative surgical procedures can be as high as 21% (36). Laser-related mortality due to perforation has been reported as 2.3% (37). In one study, quality of life was evaluated prospectively during, and at intervals after, laser therapy (38). Overall there was a significant improvement from the mean pretreatment score and the best score achieved after therapy. Patients with diarrhoea, rectal bleeding, mucus discharge or pain secondary to tumour bulk will benefit most from laser treatment. Patients in whom malignant cachexia, pain secondary to sacral plexus involvement and sphincter dysfunction are predominant over local effects of the disease do not benefit greatly, and quality of life scores deteriorate. In a study comparing costs and complications of endoscopic laser therapy versus palliative surgery (39), the authors conclude that the cost of endoscopic laser therapy is significantly less, and that hospitalization, intensive care treatment and complications are significantly higher in patients undergoing palliative surgery for colorectal cancer.

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