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Multidisciplinary Treatment of Cancer of the Rectum: A European Approach

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Surgery and local recurrence

Local recurrence is the end point of locoregional treatments such as surgery and radiotherapy. In the late 1970s Heald and colleagues [1] developed the technique of total mesorectal excision (TME). They produced evidence that in some cases nests of tumor cells outside lymph nodes could be found in the mesorectum and would have been left behind by a conventional anterior resection. With TME, emphasis subsequently became focused on the circumferential resection margin (CRM) [2]; involvement of the CME is, per se, a predictor of survival [3]. Using TME alone, Heald achieved local recurrence rates of less than 5% [4].

TME is essentially an anatomic dissection of the rectum in the plane between its fascia propria and the surrounding structures. The fascia propria is seen readily on MRI, and the relationship between the fascia propria and the tumor can be gauged preoperatively with an accuracy of more than 90% [5]. Training programs have been established in some European countries [6–8], standardizing the technique of anterior resection to some extent. There is evidence that specialization improves cancer-specific outcome, especially for rectal cancer surgery [9].

The risk factors for local recurrence are pathologic and surgical. The former include T stage and N stage, histologic grade, the level of the tumor, and the presence of vascular or perineural invasion. The latter include the completeness of removal, achieving a clear CRM and an adequate distal

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margin of 10 mm or more. There is evidence that achieving a clear CRM is, in part, surgeon related [10]. At present, a 2-mm thickness of normal tissue between the advancing front of the tumor and the CRM of the surgical specimen as determined by histopathologic examination is regarded as clear (R0 resection) [11].

Local recurrence rates are lower after anterior resection than after total anorectal excision [12]. The reasons almost certainly include the greater proximity of the lower rectum to the lateral pelvic wall and the higher incidence of an involved CRM and the greater chance of perforating the rectum during total rectal excision [11]. The surgeon may fail to clear the tumor at the level of the levator ani by employing a dissection as for an anterior resection rather than dividing the levator at its attachment to the pelvic wall and thereby minimizing the chance of an involved margin. The higher incidence of lateral pelvic lymph node involvement with tumors lying below the peritoneal reflection is also likely to be a factor. This incidence ranges from 10% to 25%, depending on the Dukes stage of the primary tumor [13–15]. The sterilization of these lymph nodes by radiotherapy may be one of the explanations for the resulting reduction in local recurrence.

In an epidemiologic study from Malmo, Sweden performed in the 1960s in a region with an autopsy rate of 82% for the whole population, 90% of the patients who had been treated for large bowel cancer were found to have distant metastases. Fifty percent had local recurrence, but only 8% of these had local recurrence without metastases [16]. This finding explains why the failure of locoregional treatments such as surgery and radiotherapy may not influence survival.

Conventional staging systems do not separate the T3 stage into prognostically favorable and unfavorable subgroups in which cancer-specific end points vary according to the degree of penetration into the extrarectal tissues. Thus respective 5-year survival and local recurrence rates are around 40% and 20%, respectively, for an extensive T3 tumor and 80% and 5%, respectively, for a T3 tumor that has penetrated the rectal wall by only a microscopic degree [17,18]. Subdividing the T3 stage into T3a and T3b based on an extrarectal spread of greater or less than 5 mm [19] may improve the quality of trials by more refined staging.

Pretreatment staging

Uniform criteria for entry into clinical trials depend on pretreatment staging. Digital examination is subjective, but it is the clinician's first contact with the tumor. It can gauge its level accurately, immediately indicating whether a restorative resection is possible. It also gives an initial impression whether local excision or adjuvant treatment should be considered, but it cannot give a reliable assessment of T stage. Endoluminal ultrasound is more than 90% accurate in determining whether penetration of the rectal wall has occurred (uT2 versus uT3) and is the imaging modality of choice