



Abdominosacral resection: Long-term outcome in 86 patients with locally advanced or locally recurrent rectal cancer

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Abstract

Aims: The purpose of this study is to evaluate the outcome of abdominosacral resections (ASR) in patients with locally advanced or recurrent rectal cancer.

Methods: From 1994 until 2012 patients with locally advanced rectal cancer (LARC) and locally recurrent rectal cancer (LRR) underwent a curative ASR and were enrolled in a database. The postoperative complication rates, predictive factors on oncological outcome and survival rates were registered.

Results: Seventy-two patients with LRR (mean age 63; 44 male, 28 female) and 14 patients with LARC (mean age 65; 6 male, 8 female) underwent ASR. R0 resection was achieved in 37 patients with LRR and 11 patients with LARC. Twenty-seven patients underwent an R1 resection (3 in the LARC group). Eight patients had an R2 resection, compared to no patients in the LARC group. In respectively 26 and 1 patients of the LRR and LARC groups a grade 3 or 4 complication occurred and the 30-days mortality rate was respectively 3% and 7%. The 5-years overall survival was 28% and 24% respectively.

Conclusion: En bloc radical resection remains the primary goal in the treatment of dorsally located (recurrent) rectal cancer. After thorough patient selection, ASR is a safe procedure to perform, shows acceptable morbidity rates and leads to a good oncological outcome.

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Keywords: Locally advanced rectal cancer; Locally recurrent rectal cancer; Abdominosacral resection; Oncological outcome; Complications

Introduction

In both primary and recurrent rectal cancer it has been shown that a more dorsal tumour is significantly associated with higher rates of irradical resection and local recurrence.^{1,2} The radicality of resection is recognised as the most important factor in the surgical treatment of LARC and LRR, and determines the local control rate and oncological outcome.^{3,4} En bloc resection of the sacrum may be the only chance for cure in patients with LARC and LRR with sacral invasion. However, these tumours are challenging to treat. For tumours invading the sacrum at the

level of S2 or higher, no uniform policy is stated. Some authors consider tumours invading at this level truly irresectable, although others state that high sacrectomy can be performed safely.^{5,6}

Advanced tumours, especially those involving other organs or the sacrum, are historically treated with palliative intent only. However, multimodality treatments and the introduction of concomitant chemoradiation for LARC and LRR have significantly improved outcome.⁷ Advances in pre-operative staging and imaging, especially magnetic resonance imaging (MRI) of the small pelvis, allow the pre-operative identification of the organs involved and allows better surgical planning. MRI enables proper patient selection and identifies patients in whom curative resection is feasible, which is of paramount importance in treating this kind of patients.⁸

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Wanebo and Marcove, reported the advantages of Abdominosacral resection (ASR) for patients with recurrent rectal cancer.⁹ In its posterior approach, a much wider resection including the os coccyx and the last vertebrae of the sacrum is possible, with a consequently higher rate of radical resections in patients with dorsally located invasive tumours.² In more recent years, the anterior approach has been suggested according to the proposed rules of TME-surgery. Oncological outcome, as described in the literature, remains disappointing, with overall 5-years survival rates varying between 15 and 30 percent and local control rates varying between 15 and 40 percent.^{10,11} Previous case series are small and have a heterogeneous population, with a wide distribution in tumour characteristics and extend of multivisceral resection.

Therefore, the purpose of this study is to evaluate the oncological outcome of ASR in locally advanced and recurrent rectal cancer and to identify clinical and pathological factors associated with outcome.

Patients and methods

Patients

The Catharina Hospital is a national referral centre for patients with LARC and LRRC. For this study, a prospectively maintained database was used. Data of 665 patients who underwent surgery for LARC and 333 patients who underwent surgery for LRRC between 1994 and 2012 were analysed. Indications for ASR included invasion of the sacrum, tumour growth into the pelvic floor muscles or lateral pelvic sidewalls and the need for a wider dorsal resection in order to achieve a radical resection margin. Patients with resection of the os coccyx were excluded from this study, because in general these resections are less invasive compared to sacral resections. Patients with metastatic disease were also excluded. Data included patient characteristics, pre-operative T stage based on MRI of the small pelvis, type of neoadjuvant treatment, operative details, pathology, postoperative complications and follow-up.

Diagnosis

In LARC, patients with a threatened (cT3+) or involved mesorectal fascia (cT4) were referred for surgical treatment. A threatened mesorectal fascia was defined as tumour growth within 2 mm of the fascia. An MRI was performed to analyse local tumour growth. An ASR was indicated when the MRI showed sacral tumour involvement. No distinction was made between ingrowth into the fascia or bone. All patients were discussed in a multi-disciplinary team meeting, where the results of the imaging were discussed and consensus in treatment strategy was achieved.

Neoadjuvant treatment

Most patients with LARC were treated with chemoradiation and received 50 Gy (5×1.8 Gy a week). LRRC patients who were previously irradiated, received re-irradiation with a dose of 30 Gy (5×1.6 Gy a week), with concomitant chemotherapy. LRRC patients who did not have been irradiated in the past, received full course irradiation with chemotherapy. Different types of chemotherapy schedules are used; a schedule with Capecitabine 825 mg/sqm during 7 days in all the weeks of radiation was used more frequently.¹²

Surgical procedure

Patients were regarded as suitable for resection if there was no nerve root involvement above the level of L1-2, no sacral invasion in proximal S2, and no extension of the tumour through the incisura ischiadica majora. There were no relative contra-indications to offering surgery. Ureter catheters are placed the day before surgery in order to identify and subsequently avoid damage to the ureter during surgery. The ASR is started with the abdominal phase. Whenever invasive tumour growth is only identified dorsally by MRI, the rules proposed by TME-surgery are followed anteriorly, meaning that the dissection plane followed Denonvilliers' fascia.^{13,14} If invasion into other organs is present, an en bloc multivisceral resection is performed. Transection of the mid sacrum S2–S4 is performed during the abdominal phase, because the venous plexus collapses in a supine position and blood loss will be much less. Transection distal to S4 is also performed in a lithotomy position. It may be helpful to identify the level of sacral transection by a full thickness sections cut through the sacrum with the osteotome (chisel) during the abdominal phase. The level of transection should be distal to the dura mater, which projects as far as the centre of the S2 vertebra.¹⁵

Before the patient is turned into the prone position, the abdominal phase is completed by closure of the abdomen and formation of a stoma. A midline incision is made across the sacrum from the L5 vertebra to the perineum. The incision is continued around the anus or scar, in recurrent rectal cancer patients after an abdominoperineal extirpation (APE). The gluteus muscle insertion from the sacrum, the sacrospinous and sacrotuberous ligaments are transected close to the sacrum. The levator ani muscles are in direct view following this step and are transected close to their lateral insertion at the obturator internus muscle. The sacral resection is completed by a cut with the osteotome in the dorsal cortical wall in a V shape, in order to avoid damage to the sacral roots. An omentoplasty is used to fill the presacral space. In most cases, primary wound closure will be feasible. In case of a large defect, a vertical myocutaneous rectus abdominus flap (VRAM) is rotated in the perineal wound. Surgical

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