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Review

Curative pelvic exenteration for recurrent cervical carcinoma in the era of concurrent chemotherapy and radiation therapy. A systematic review

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Abstract

Objective: Pelvic exenteration requires complete resection of the tumor with negative margins to be considered a curative surgery. The purpose of this review is to assess the optimal preoperative evaluation and surgical approach in patients with recurrent cervical cancer to increase the chances of achieving a curative surgery with decreased morbidity and mortality in the era of concurrent chemoradiotherapy.

Methods: Review of English publications pertaining to cervical cancer within the last 25 years were included using PubMed and Cochrane Library searches.

Results: Modern imaging (MRI and PET-CT) does not accurately identify local extension of microscopic disease and is inadequate for pre-operative planning of extent of resection. Today, only half of pelvic exenteration procedures obtain uninvolved surgical margins.

Conclusion: Clear margins are required for curative pelvic exenterations, but are poorly predictable by pre-operative assessment. More extensive surgery, i.e. the infra-elevator exenteration with vulvectomy, is a logical surgical choice to increase the rate of clear margins and to improve patient survival following surgery for recurrent cervical carcinoma.

Keywords: Pelvic exenteration; Recurrence; Cervical carcinoma

Introduction

Cervical cancer represents a major public health burden with 529,000 new diagnoses and 275,000 deaths annually worldwide.[1] Treatment options differ depending on the extent of tumor spread at the time of diagnosis. Early cervical cancers, defined as ≤ IB1 by the International Federation of Gynecology and Obstetrics (FIGO) classification,[2] can be treated by surgery (radical hysterectomy and lymphadenectomy) and/or radiation therapy with equivalent results in terms of relapse-free and overall survival.[3] For cases of locally advanced cervical cancer, ≥ FIGO IB2, concomitant chemoradiotherapy is recommended based on the results of clinical trials from the 1990s.[4–7] Today

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concomitant chemoradiotherapy is the primary treatment for approximately 70% of patients.[8] Despite local control and a prolongation of disease-free survival, an estimated 20–30% of patients develop recurrent disease within the radiation field. The majority of recurrences occur 18–24 months following initial treatment. Risk of recurrence increases with FIGO stage and is estimated to be 10% for stage IB patients, 17% for IIA, 23% for IIB, 42% for III and 74% for IV.[9]

When local recurrence occurs, treatment options are limited due to the frequent use of pelvic irradiation for primary cervical cancer. Reirradiation of the same anatomic site is contraindicated, and chemotherapy is ineffective at controlling tumors located within the previously irradiated tissue that tends to be less vascularized.[10,11] A recent Cochrane review was unable to compare the effectiveness of medical (radiotherapy and/or chemotherapy) versus surgical treatment for recurrent cervical cancer given the absence of randomised controlled trials.[12] Surgical resection is often the only treatment option for disease recurrence but it is associated with a high rate of complications due to the fragility of the tissue after concomitant radiochemotherapy.[9] Curative surgical resection of locally recurrent cervical cancer is pelvic exenteration with removal of neighboring organs such as bladder and rectum.[9,11,13] However, there is a lack of consensus regarding the optimal extent of the resection margins and whether the best chance of cure should include a pelvic exenteration with anterior, posterior and/or inferior exenterations. There is also no clear definition as to which patients should undergo curative versus palliative treatment. For example, lateral pelvic recurrences are considered eligible for resection by some teams, yet unresectable by others.[14]

The goal of this review is to define the preoperative workup for recurret cervical cancer to guide the selection of patients for curative surgery, as well as the optimal extent of surgery in terms of morbidity and mortality.

Materials and methods

The literature was reviewed for articles published during the past 25 years using the following Medical Subject Headings (MeSH): pelvic exenteration, recurrent cervical cancer, cervical cancer treatment, radiotherapy and cervical cancer. All meta-analyses, systematic reviews and original articles written in English were reviewed. The following databases were searched:

- Medline: PubMed (Internet portal of the National Library of Medicine) http://www.ncbi.nlm.nih.gov/sites/entrez?db=pubmed
- The Cochrane library: Cochrane-database 'Cochrane Reviews' and 'Clinical Trials' http://www3.interscience.wiley.com/cgi-bin/mrwhome/106568753/HOMEDARE

Results

Pre-operatory evaluation of cervical cancer recurrence

Evaluating the extent of recurrent tumor growth is important for proper patient management. Recurrent cervical cancer is classified as a central pelvic recurrence when the tumor is limited to the vagina, bladder, rectum and/or parametrium, and as a lateral pelvic recurrence when it spreads to the muscles and vasculature of the lateral pelvic wall. Local tumor extension needs to be accurately defined to guide proper surgical management. It is also important to eliminate the presence of metastatic tumor, which is considered to be an incurable progression of disease. Distant recurrent cervical cancer involves para-aortic, supra-clavicular or pulmonary lymph nodes in 81%, 7%, and 21% of cases respectively.[15]

Preoperative evaluation of the extent of cervical cancer spread traditionally involved clinical examination of the patient under general anaesthesia with endoscopic evaluation of the bladder and/or rectum as required. Magnetic resonance imaging (MRI) is now the preferred modality to evaluate the size of the tumor, and its relationship with neighboring organs (Table 1).[16] Compared to computed tomography (CT), MRI has a higher sensitivity for detecting spread to the bladder (75%), rectum (71%), parametrium (74%) and lymph nodes (60%). The specificity of MRI is generally comparable to CT, with the exception of bladder invasion which has been found to have a specificity of 91%

Table 1
Performance of MRI in detecting extent of pelvic tumor invasion and presence of nodal metastases in patients with primary and/or recurrent cervical cancer.

Organ evaluated		Bladder	Rectum	Lateral pelvic compartment	Nodal metastases
Popovitch[19]	Se	67%	67%	80%	
	Sp	93%	93%	76%	NA
	PPV			50%	
Bipat[17]	NPV			100%	
	Se	75%	71%		60%
	Sp	91%		NA	
	PPV				
Rockall[16]	NPV				
	Se	100%	100%		
	Sp	88%	91%	NA	NA
	PPV	100%	100%		
Forner[18]	NPV	7%	17%		
	Se			75%	75%
	Sp	NA	NA	65%	52%
	PPV			65%	56%
Donati [20]	NPV			75%	69%
	Se	87%	75-81%	75–87%	
	Sp	93–100%	97%	94–97%	NA
	PPV	91–100%	92%	75–87%	
	NPV	90%	89-91%	94–97%	

Se: sensitivity, Sp: specificity, PPV: positive predictive value, NPV: negative predictive value, NA: Not available.