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Short Communication

Predictors of early vaginal stenosis during pelvic radiotherapy for locally advanced cervix cancer: a study from a tertiary cancer centre in Eastern India

Aparna Gangopadhyay[1], Jaydip Biswas[2]

[1]*Department of Radiation Oncology, Chittaranjan National Cancer Institute, Kolkata, India,* [2]*Department of Medical Oncology, Chittaranjan National Cancer Institute, Kolkata, India*

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Abstract

Aim: To explore possible predictors of early vaginal stenosis among patients with locally advanced cervix cancer on pelvic chemoradiation.

Patients and methods: A total of 232 patients with locally advanced cervix cancer, who received pelvic radiotherapy at our institute from November 2011 to October 2013, were prospectively studied. Possible predictors chosen were age, tumour stage, initial vaginal involvement, concomitant chemotherapy and development of vaginitis of Radio Therapy Oncology Group grade 2 or more during radiotherapy. Multiple logistic regression was carried out to assess predictors and the relative risk of predictors was calculated.

Results: Initial vaginal involvement and addition of concomitant chemotherapy are predictors of early vaginal stenosis in locally advanced cervix cancer patients on pelvic chemoradiation. Relative risk for early vaginal stenosis with vaginal involvement at presentation was 16·31, whereas that for concomitant chemotherapy was 9·95.

Conclusion: Among patients with locally advanced cervix cancer receiving pelvic chemoradiation, two factors, namely, initial vaginal involvement and concomitant chemotherapy are predictive of early vaginal stenosis. Patients with these factors should be assessed at regular intervals for early vaginal stenosis during pelvic chemoradiation to assess the optimal timing of intracavitary brachytherapy. This is particularly of importance in the absence of facilities for interstitial brachytherapy to ensure appropriate target coverage.

Keywords: intracavitary brachytherapy; locally advanced cervix cancer; vaginal stenosis

INTRODUCTION

Vaginal narrowing after external beam radiotherapy in locally advanced cervix cancer has an impact on both patients' quality of life as well as on subsequent brachytherapy applications. Difficult local examination, distal displacement of the vaginal applicator and restricting choice of a vaginal applicator to a smaller diameter are some of the major problems faced during intracavitary insertions in these patients. Evidence in literature has established that there is displacement

Correspondence to: Aparna Gangopadhyay, Department of Radiation Oncology, Chittaranjan National Cancer Institute, 377, M.B. Road, Panchanantala, Kolkata 700049, India. Tel: +91 983 638 6469. Fax: +91 332 541 0088. E-mail: mails7778@gmail.com

of intracavitary brachytherapy applicators caused by early vaginal stenosis in patients with gynaecological cancer.[1] This study aimed at finding possible predictors for early vaginal stenosis during the course of pelvic radiotherapy.

MATERIALS AND METHODS

A total of 232 patients with locally advanced cervix cancer, who received pelvic radiotherapy at our institute from November 2011 to October 2013, were prospectively studied. All patients received radiotherapy with AP-PA fields in telecobalt (Theratron 780c Best Theratronix Ltd., Ottawa, Canada); this eliminated differences arising from use of variable photon energy and fields. Presence of radiotherapy-induced vaginal stenosis was assessed at first brachytherapy insertion. Individual patient characteristics and presence of possible predictive factors for vaginal stenosis as found in literature were noted for individual patients. The chosen factors were age, tumour stage, initial vaginal involvement, concomitant chemotherapy and development of vaginitis of Radio Therapy Oncology Group (RTOG)[2] grade 2 or more during the course of radiotherapy. Multiple logistic regression was employed to find possible predictors and the relative risk of predictors was calculated. MedCalc version 12 was used for statistical calculations.

RESULTS

Patients' median age for our study group was 48 years (ranging from 29 to 67 years). The most common stage of tumour was IIIB accounting for 61% of all patients.

Multiple logistic regression identified two predictive factors to be significant, namely, initial vaginal involvement and addition of concomitant chemotherapy. Relative risk was calculated for these predictors. Relative risk for stenosis with vaginal involvement at presentation was 16·31, whereas that for concomitant chemotherapy was 9·95. A total of 96% of all patients who received concomitant chemotherapy developed early vaginal stenosis. The other factors studied, namely, age, tumour stage and occurrence of local acute radiation toxicity of at least RTOG grade 2 were not significant with respect to occurrence of stenosis.

DISCUSSION

Radiotherapy for cervix cancer is associated with vaginal stenosis and shortening in the long term.[3] Long-term morbidity has a significant impact on patients' quality of life, and has been explored in much detail.[4] Research has revealed probable predictors associated with late vaginal morbidity; addition of chemotherapy has been identified as one such factor.[3,5] Early vaginal toxicity that occurs during the course of treatment is underexplored. The shortening and narrowing of the vagina during external beam pelvic radiotherapy leads to difficulties in local examination and intracavitary brachytherapy insertions, affecting the course of treatment and may potentially influence local disease control in the long term. This is particularly true for locally advanced cervix cancer where radiotherapy is the standard of care and brachytherapy is indispensible. Although pelvic radiotherapy takes care of the pelvic nodes and also parametrial disease burden to a great extent, inadequate coverage of the intermediate risk clinical target volume (CTV) during brachytherapy offsets the advantage of disease control that would ideally be obtained with combined pelvic radiotherapy and brachytherapy.

There is evidence in literature that early vaginal stenosis does influence displacement of brachytherapy applicators which in turn cause shifts in dose distributions.[1] The clinical impact of these changes is not clearly evident owing to lack of established evidence in literature, although studies such as Embrace[6] demonstrate the importance of vaginal dose recording.

In our experience, early vaginal stenosis in patients treated with pelvic radiotherapy for locally advanced cervix cancer is substantial; over one-third of patients at our institute experience early vaginal narrowing after pelvic radiotherapy that affects adequate local examination and, in many cases, leads to choice of a brachytherapy applicator of smaller dimension. In locally advanced disease where the medial parametrium forms part of the intermediate risk CTV, the contribution from

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brachytherapy to cover this area is of great importance.[7]

In the absence of facilities for interstitial brachytherapy for cervix cancer at all centres owing to limited resources and the need for adequate parametrial coverage in locally advanced disease, a judicious use of intracavitary brachytherapy is often the only option. Interdigitation of brachytherapy fractions with pelvic radiotherapy is a solution. However, interdigitation is not always feasible owing to limited resources.

In view of these issues, an exploration of the factors that predispose to early vaginal stenosis was of particular interest.

A number of predictors of late vaginal morbidity have already been identified in literature. Our search for possible predictors was based on these along with a study of patient and disease characteristics that have an association with acute radiation toxicity in other sites.

Interestingly, the results of our study showed no impact of age on vaginal narrowing in the short term, in contrast to the case for late vaginal morbidity where some studies indicate that risk of stenosis increases with age.[3] Vaginal involvement at presentation had significant impact on early vaginal narrowing, very similar to the long-term scenario.[5] Among the two factors that were found to be significant predictors on multivariate analysis, vaginal involvement had greater impact.

Concomitant chemotherapy is essential for radiotherapy treatment in locally advanced cervix cancer. The impact on early stenosis in patients receiving chemoradiation was also found to be significant among our patients, with the occurrence of early stenosis being directly related to the dose of chemotherapy received. As a large number of our patients present with locally advanced disease, this finding is of particular interest in our scenario.

The advent of image-guided adaptive brachytherapy has improved target coverage, but in a setting such as ours, where limited infrastructure does not always allow use of interstitial techniques or image-guided treatments, regular assessment of patients with these predictors for early stenosis would probably help to select them for interdigitation of brachytherapy with pelvic chemoradiation.

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Conflicts of Interest

None.

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