

## How Long Should Be The Radiation Oncology Treatment for Cervical Cancer?

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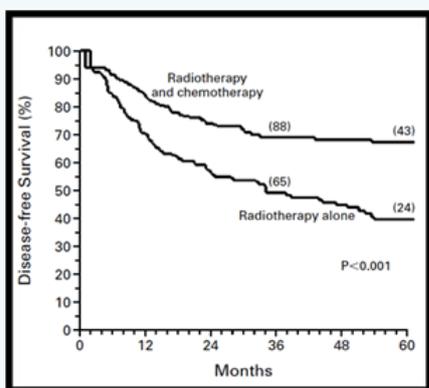
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### Mini Review

Historically locally advanced cervical cancer was treated with teletherapy and a boost with brachytherapy. But in 1999 the treatment changed favorably, thus establishing the current management based on concurrent chemo-radiotherapy, thanks to the publication of some studies [1,2] that showed survival advantage of this disease with the addition of platinum-based chemotherapy and radiotherapy (Figure 1).



**Figure 1:** Survival among Patients Assigned to Receive Radiotherapy and Concurrent Chemotherapy and Those Assigned to Receive Radiotherapy Alone [1].

Today, I would like to emphasize the importance of the time factor throughout the radiotherapy treatment, meaning that it consists of teletherapy and brachytherapy, and the latter is not optional, it represents a fundamental part of the treatment in uterine cervix and endometrial cancer.

Some studies recommend completing treatment by an average of 56 days (8 weeks) [3,4], and other in 63 days (9 weeks) [4], but this basically depend on the total dose/daily fraction, Boost to parametria, number of implants, and high or low dose rate brachytherapy, that are dependent factors

accord protocols and availability of radiation oncology center, in addition we should also mention other factors related to the patient as: possible temporary suspension due to toxicity during treatment or difficulty attend it due to limited resources, those related to coverage offered by different insurance companies and related to one's own country, such as holidays.

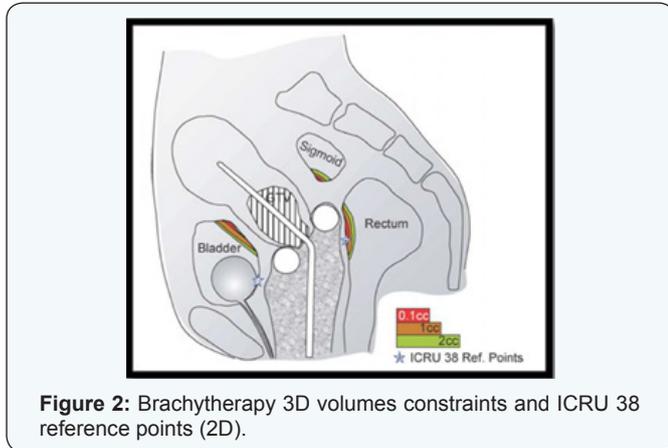
Overall average to complete the entire treatment is 60 days for stage IB-IIA, 63 for stage IIB and 65 days for stage III [5]. Several retrospective studies have reported lower pelvic control and cancer-specific survival in patients whose treatment duration is prolonged, however, they were generally made in the pre chemoradiation era.

When referring to treatment with brachytherapy, the word "brachys" comes from Greek and means near or within distance. It is a treatment where a radiation source is close as possible to the tumor or area where it was introduced. The dose and duration of exposure is expected in advance and incoming materials may be left in place or removed. Just as the procedure has evolved from the conventional technique made by 2D radiographs plan, in which must take into consideration the called Points A and B, administered an implant once week to achieve 3-4 implants, actually can do 3D brachytherapy [6-8], where we can use CT and MRI scan and in this case we will rely on clearly defined volumes, and can perform the procedure with minimal intervals of 48 hours and achieve up to 5 implants depending on the multidisciplinary discussion of each case [7-12].

The time to complete brachytherapy are significantly associated with local failure or pelvic recurrence of the disease, however, has not been associated with distant failure or disease-specific mortality. Some studies indicate that the 3-year cumulative failure or pelvic recurrence rate after treatment is completed in less than 56 days is 9% vs. 26% when it is completed in more than 56 days [3], other associated factors are: younger and low hemoglobin levels, but it is very important to

consider the factors mentioned initially.

Other studies emphasize that for locally advanced stages, cause-specific survival at 5 years and pelvic control rates are 71% and 87% respectively, when the average processing time is 63 days (Figure 2) [4].

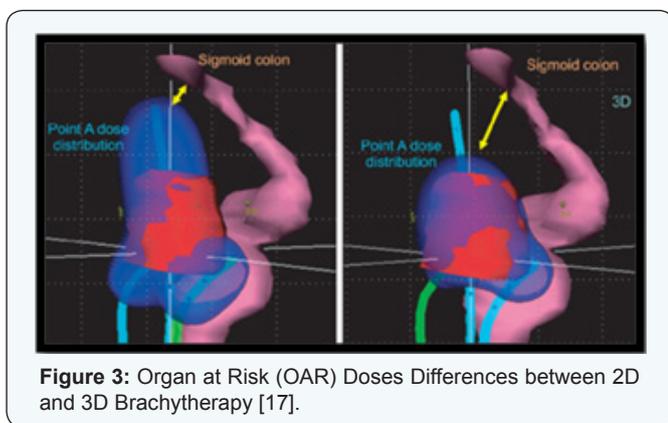


**Figure 2:** Brachytherapy 3D volumes constraints and ICRU 38 reference points (2D).

Several authors have reported rates of loss of local control ranging from 0.7% to 1.6% [5,6] per each additional day of treatment, which could be explained by the rapid repopulation of tumor cells, influencing the probability of local control.

Additionally some authors [4] have evaluated the influence of the interval between the last application of the teletherapy with the first one of brachytherapy, comparing: <7 days vs. ≥7 days in cause-specific survival and pelvic control rate, demonstrating no significant impact in the first five days, but in the second the difference was 94% vs. 84% for intervals <7 days vs. ≥ 7 days.

In the case of uterine cervix cancer should be administered as an adjuvant to radiotherapy. The American Brachytherapy Society (ABS) [9] supports the use of it as an integral component of definitive treatment of locally advanced cervical cancer. Nonsurgical curative standard therapy in this cancer involves a combination of chemotherapy, external beam radiotherapy and brachytherapy [9,10].



**Figure 3:** Organ at Risk (OAR) Doses Differences between 2D and 3D Brachytherapy [17].

Some studies have shown that brachytherapy achieves better dose conformation, allowing it to increase dose tumor, while preserving adjacent normal tissues, compared to various techniques of external beam radiotherapy [12,13]. Recent technological advances related to imaging, scheduling and execution of brachytherapy for cervical cancer reported local control rates of 100% for stage IB, IIB 96% for and 86% for stage IIIB [13] (Figure 3).

Despite the excellent results obtained with brachytherapy in cervical cancer, a surprising number of patients not receiving it. In the United States, according to records that included 7359 patients with cervical cancer treated with external beam radiotherapy from 1988 to 2009 there was a 25% reduction in the use of brachytherapy which was reflected in a 13% decrease in the rate of survival specific cause [14]. According to statistics estimations made for 2015 [15] in the United States, expected 12,900 new cases of cervical cancer (1.59%) with 4,100 deaths (1.47%), been a little more specific we can see that squamous cell carcinoma (SCC) accounts for 75% of cervical cancer cases in the USA, while adenocarcinoma (AC) accounts for 25%. The incidence of SCC is decreasing in the USA, yet AC is increasing [16,17], however, the reality is very different in countries like the Dominican Republic and Venezuela where the estimated percentages are extremely high, reaching compete cervical cancer and breast cancer for first place.

Cancer treatment should always be discussed in a multidisciplinary medical committee.

Dear patient, brachytherapy for cervical cancer is NOT optional, represents a fundamental part of your treatment.

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