

## **Interstitial brachytherapy of the breast and penis**

### **Summary**

**Aims:** Interstitial brachytherapy (BT) is a therapeutic method with a proven history used in treatment of various cancers. In our work we focused on accelerated partial breast irradiation with multicatheter interstitial brachytherapy (MIB APBI) of early breast cancer due to the high incidence of this disease and on BT of early penile cancer as an alternative to primary surgical treatment.

### **Methods and materials:**

- 1) High dose rate brachytherapy (HDR BT) for MIB APBI of early breast cancer has been used at the Department of Oncology and Radiotherapy, University Hospital and Medical Faculty, Hradec Králové since 2012. Brachytherapy catheters are inserted perioperatively in the time of tumorectomy and sentinel node biopsy. APBI starts on day 6 after surgery. The prescribed dose was 34 Gy in 10 fractions applied twice a day. We evaluated 125 patients with minimum follow up of 2 years.
- 2) Twenty-eight patients with early penile cancer underwent HDR brachytherapy between 2002-2020. The prescribed dose was 18x 3 Gy applied twice a day.

### **Results:**

- 1) One hundred twenty-five patients were indicated for APBI, 12 patients of these did not receive this treatment (9.6 %) due to adverse prognostic factors in the final histology. In these patients the inserted catheters were used as boost before external beam radiotherapy. With a median follow-up of 39 months (3.3–75.3) there was no cancer recurrence. In patients with follow-up longer than 24 months, cosmetic outcome was rated as excellent or good in more than 90 % of patients.
- 2) In patients after penile BT with a median follow up of 92 months (3.7–219), local recurrence occurred in 7 cases, the median to recurrence was 39 months (7-98). Six of them underwent partial amputation of the penis and are disease free. One patient with local recurrence died of new primary lung cancer. One patient suffered nodal recurrence successfully treated by lymphadenectomy and radiotherapy. Twenty patients live with a preserved penis and 19 of them are still sexually active. Four patients died (1 of duplicate lung cancer, 3 of internal comorbidities). According to Kaplan-Meier analysis 5-year overall survival was 96.4 %, 5-year disease free survival was 77,7 % and 5-year survival without local recurrence was 81.1%.

**Conclusion:** MIB APBI is suitable treatment method in selected patients with early breast cancer. Perioperative insertion of catheters leads to shorter overall time of treatment and allows direct visual control during insertion of catheters. Cancer control and cosmetic outcome were very good. Penile BT is method which can preserve penis in many patients with good quality of life. Local recurrence can be salvaged by surgery without affecting the overall survival of patients.