The Benefits of using IORT as Boost combining Hypofractionated whole breast IGRT for Breast Cancer

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HIGHLIGHT
We think the use of IORT as boost combining hypofractionated IGRT of WBI is a safe and efficient way of treating breast cancer patients. This approach provided the most accurate targeted treatment for the patients, it also has a significant benefit for social&economic situations in our country. This technology shortens almost 50% treatment time for the patients, also with less medical costs and reduced mental pressures. Most interestingly, due to the major local health insurance policies in our State, both the insurance provider and the hospital get the benefits from using this technology. So this provides us a win-win mode in our opinion and might also work for other cancer institutes around the world.

Introduction/purpose:
Breast-conserving surgery followed by whole breast irradiation (WBI) has been considered as a standard for early stage breast cancer. Normally WBI is 50Gy in 25 fractions followed by 10–16Gy boost in 5-8 fractions which take about 6.5–7 weeks.

Hypofractionated WBI and Accelerated partial breast irradiation (APBI) including IORT has been recognized as cutting-edge technologies for breast cancer treatment. While both have strict indications and are not spread widely in China. The purpose of our study is to work out a way in our country to provide the most precision medical treatment with a balanced national social&economic situations.

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Methods:
In contrast to the conventional fractionated treatment, we use intrabeam IORT system (Zeiss) to treat the tumor bed as a boost (right after the lumpectomy procedure) which take 15–30 mins (Figure 2), and then in about 4 weeks we’ll treat the patients with hypofractionated IGRT for the WBI part(4250cGy in 16 fractions) which takes around 3.5 weeks based on the pathology reports. We use Cone-beam CT (CBCT) for image guided radiotherapy (Figure 3) instead of EPID approach to achieve best treatment accuracy.

Results:
We’ve been treated over 30 patients with this method in the past 2 years. All the patients were satisfied with the short-term results including cosmetic results and toxicity tolerance. While the long-term results including local control rates and survival rates still need further follow-ups.

We’ll try to treat more patients with this technology in the future and collect long-term datas for clinical analysis. We’ll also work with the insurance provider in our country/states to get better insurance coverage for this tech with the datas we collected.


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Figure 1. Combined IORT and hypofractionated WBI reduced the total treatment time by at least 50%

Figure 2. Workflow of IOERT treatment during a BCS