

short scheduled intensity modulated RT (IMRT) in bone metastases under public assisted health insurance country

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Background

Conventional external beam RT has used in cancer patients with bone metastases. 30 Gy/10 fxs schedule (2 weeks) has been generally used. IMRT technique is able to shorten RT schedule by 1~5 days schedule with improved local tumor control and better pain relief. However, IMRT needs new expensive RT facility and its cost is also bigger than conventional RT. In Korea, reimbursement are all settle by National health insurance system (NHIS). And NHIS approved IMRT for bone metastases in 2016. however there is no data for this expansion's economic effects.

Objective

The purpose of this study was

1. Assess the cost difference between conventional RT and IMRT under NHIS.
2. Assess that Increased IMRT reimbursement meets cost-effectiveness.

Results

Methods	Cost*	Duration
Conventional RT	796\$	2 weeks
IMRT (5 fxs)	2830\$	3 days(plan)+1week (Tx)
SBRT** (2~4 fxs)	2974\$	3 days(plan) +2~4 days (Tx)
Single Fx SBRT	1919\$	3 days(plan) +1 day (Tx)

Table 1. RT cost of NHIS in Korea (1\$=1150KRW)

* Patients sharing is 5 % of cost. Some elective physicians reimbursement increase 50%

** Stereotactic Body radiation therapy (higher RT dose per day using IMRT)

Under Markov model (assuming the pain control rate 76%(RT) vs 88%(IMRT)), Short scheduled IMRT and SBRT is favored **over 50,000\$ per Quality-adjusted life year**. If considering the admission cost during RT period (approx. 60\$/day), IMRT and SBRT is favored in most of QALY range.

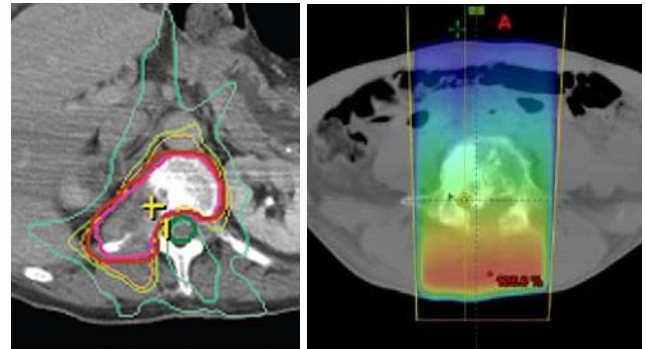


Figure 1. Radiation dose distribution of IMRT (Left) and conventional RT (Right)

Discussion

IMRT is effective modality in pain control and its short total treatment period. Especially, IMRT is essential for reirradiation case and bone metastases from radio-resistance tumor (RCC or Sarcoma origin). IMRT's short treatment period can contribute to solve chronic deficiency of the oncology wards nationwide in Korea. Because patients prefer to stay during her and his RT period in Korea.

This shorten hospital stay period or early finish of RT session are also reasons of the patients willing to pay more for IMRT treatment. Actually, the patients sharing of cost is affordable for most of patients.

However, in terms of NHIS budget, there is pitfalls of using IMRT unnecessarily for the patients who can be treated by conventional RT. In hospitals' perspective, They want to treat more IMRT patients to achieve economy of scale because most of Linac accelerators (RT facility) which can treat IMRT are introduced after 2010 with relatively high machine price.

Conclusion

In Korea, short schedule IMRT and SBRT could be adequate treatment option for cancer patients. The result also emphasized the importance of adequate pricing of the novel treatment technique to avoid overuse and sound finance status of NHIS.