

A dose-finding study of IORT after radical prostatectomy (RP) in prostate cancer[#]

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Purpose

The rate of local recurrence after RP ranges from 4% to 23% in T1/2 and is greater than 40% in T3 tumors. Local recurrence occurs more frequently in the bladder-urethral anastomosis (66%), bladder neck (116%) and retrotrigonal area (113%). A high risk of local failure after RP includes patients with one or two risk factors (PSA > 10 ng/ml, Gleason score (GS) \geq 7, positiveness in almost 2/3 bioptic specimens, clinical stage \geq T2b). Recent studies established that the α/β ratio in prostate cancer is 1.5-2 Gy, i.d., lower than assumed for late responsive normal tissues. Therefore, the administration of a single dose should represent a more convenient irradiation method. We began a dose-escalation study (based on Fibonacci method) by employing IORT after RP in patients with intermediate risk prostate cancer. Acute and late toxicities following escalating doses were monitored.

Materials and methods

18 pts received IORT at escalating doses of 16 Gy, 18 Gy and 20 Gy. The inclusive criteria were: age < 75 years, clinical stage NO and/or 2 of the abovesaid risk factors. As toxicity was absent in further 10 pts treated with 20 Gy, a dose escalation to 22 Gy was carried on, according to the planned strategy. IORT was deliv-

ered after RP, bladder-urethral anastomosis manufacture and bilateral obturator nodes sampling, by means of a dedicated Linac (Novac 7 Hitesys, highest energy 9 MeV). The treatment port including the surgical bed and the anastomosis was irradiated through a sterile applicator with a 22° angled edge and diameter of 4-6 cm. The electron energy was selected in order to include all the structures in 90% isodose. An in vivo dosimetry was performed by introducing a Mosfet dosimeter in a rectal catheter and a Mosfet micro-dosimeter placed close to the anastomosis through a Foley catheter.

Results and conclusions

Our cases analysis showed a pathologic upgrade as to the clinical data in 63.9% of cases, while a downgrade or an unchanged stage was seen in 15.3% and 20.8%, respectively. Positive margins were found in only 2 cases (7%). Pathological GS compared to biopsy GS was higher in 43% of cases, lower in 18% and unchanged in a further 39%. In all cases, in vivo dosimetry showed an absorbed dose to the rectum wall < 1%. The presently available data show that the highest level of dose-finding was well tolerated, without any detectable rectal or vesical toxicity or anastomotic leakage protraction. A longest follow-up is necessary to verify the real impact of IORT in prostate cancer in term of late toxicity and loco-regional control.

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