Introduction

- Prostate biopsies targeted by elastic fusion of magnetic resonance (MR) and three-dimensional (3D) transrectal ultrasound (TRUS) images can achieve accurate identification of the index tumor (IT), defined as the lesion with the highest Gleason score or the largest volume.

- A recent consensus conference on focal therapy in prostate cancer defined focal therapy as an anatomy-based treatment strategy.

- We evaluated the accuracy of MR-TRUS image fusion biopsy in characterizing its comparison with radical prostatectomy (RP) specimens and considered the indication of focal therapy in our cohort.

Materials and methods

- We retrospectively analyzed 39 patients who underwent MR-TRUS image-fusion-targeted biopsy (TB), followed by robotic RP at Hiroshima University Hospital.

- Each patient underwent at least one image-guided TB (median 2 cores) of MR-suspected IT lesions by Prostate Image Reporting and Data System (PI-RADS) version 2 to detection to 10 core systematic biopsies (SB). We used elastic image fusion and real-time 3D tracking technology (TRINITI, Koelti, Grenoble, France).

- The largest geographical distinct cancer focus (IT lesion) proven by TB was independently registered on step-section RP specimens.

Patients characteristics

- We analyzed 74 patients who underwent MR-TRUS image-fusion-targeted biopsy (TB) and followed by robotic radical prostatectomy.

- The concordance of the largest tumor diagnosed by TB and the largest tumor in radical prostatectomy specimen.

Results

- The concordance between focal therapy in prostate cancer in future

Materials and methods

- We examined 32 patients with one MR-visible TB-proven tumor in intermediate risk.

- The 12-core extended sextant transrectal ultrasound-guided needle biopsy is unable to safely identify candidates for focal therapy.

- MR-ultrasound fusion-guided prostate biopsy is recommended as a modality of choice for selection of patients for focal therapy.

- 16% of cases with low-volume prostate cancer had Gleason pattern 4. However, none of these cases had extraprostatic extension, seminal vesicle invasion, or lymph node metastases. As such, these patients may be acceptable candidates for focal therapy.

- The potential appropriate candidate for focal therapy

In case that focus of the clinically significant cancer (tumor of larger 0.5ml) is controlled by focal therapy, this patient can be followed up as active surveillance of low risk cancer.

Focal therapy

- We defined as appropriate candidate as one tumor of larger 0.5ml in RP

- only TB with SB in the same area of TB, or multiple SB: +P=0.072

- Tumors with positive cores detected by only TB or TB with SB in the same area of TB might be candidate of focal therapy.

Conclusion

- Targeted biopsies using magnetic resonance images combined with real-time 3D transrectal ultrasound is a reliable diagnostic tool to identify the location and Gleason score of the index tumor, and opens the door for the focal therapy in future.

- The potential appropriate candidate for focal therapy

SUMMARY

- The concordance between index tumor on biopsy and RP specimen was 93% (7/27).

- The concordance of number of significant tumors between biopsy and RP specimen was 92% (7/27).

- The concordance for overall Gleason scores between index tumor location on biopsy and RP specimen was 91% (7/8).

- For focal therapy of prostate cancer in future

- Pathological Findings in Multiparametric Magnetic Resonance Imaging Fusion Prostate Biopsy: Extended Sextant Biopsy vs. Targeted Biopsy

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