

PP-04**Relationship between intra-operative prostatic swelling during HIFU and unsuccessful ablation assessed by contrast MRI and biopsy: Implication for focal HIFU therapy**

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Introduction and Objectives: We recently reported that significant prostatic swelling and shift of the prostate occurs during HIFU. We hypothesize that unsuccessful treatment by HIFU may be secondary to untreated gaps between adjacent HIFU foci caused by intra-operative prostatic swelling and shift. The objective of our study is to identify a relationship between the intra-operative prostatic swelling and unsuccessful ablation by contrast MRI and post-operative biopsy.

Methods: Thirty-four patients with clinically localized prostate cancer (median age, 66; PSA, 7.7 ng/ml, and Gleason score 5/6/7, n=3/14/17) underwent whole gland HIFU followed by 3 monthly PSA, and systematic prostate biopsies at 6 months. Intra-operative prostatic swelling was quantified by computer-assisted 3D reconstructed prostate volumes based on intra-operative TRUS. Postoperative contrast MRI, obtained within 25 days (median 10.5 days), was used to classify treatment success based on the size of residual enhanced areas within the prostate: class III, clinically significant enhanced area (defined as greater than 0.5ml in volume); class II, minor enhanced area (less than 0.5ml); and class I, completely unenhanced (Figure).

Results: Percent increase of prostate volume in class I (n=9), II (n=17), and III (n=8) were 5%, 18%, and 37% (p<0.001), indicating that class III had significantly greater prostatic swelling. Median PSA nadir in class I, II, and III were 0.02ng/ml, 0.10ng/ml, and 0.63ng/ml (p<0.002), indicating that class III had a higher biochemical failure rate. Post-operative biopsy-proven residual cancer was found in only class III (26%) (p<0.001). Biochemical free survival rates were significantly different between the 3 MRI-classified groups (Log rand test, p=0.007).

Conclusion: Intra-operative adjustment of the treatment focus according to intra-operative swelling during HIFU may have a significant impact for improving the success of targeted focal HIFU therapy.

