

**WCIO
2013**

16–19 May 2013

**Pre-Procedure Imaging
Guidance, Targeting,
and Quantification**

**Customizing the ablation strategy
with robotic assistance**

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Robotic-Assisted Ablation Strategy Trial

Main inclusion criteria

- Liver CRC mets
- Tumor number <4 ,
≤ 4 cm
- Venous phase CT (at
least 2.5 mm collimation,
2.5 mm reconstruction
interval)

(n=18)

Manual
planning

Robotic
planning

Primary endpoints

- Any change in ablation strategy
- Change in ablation protocol
- Change in entry point

Secondary endpoints

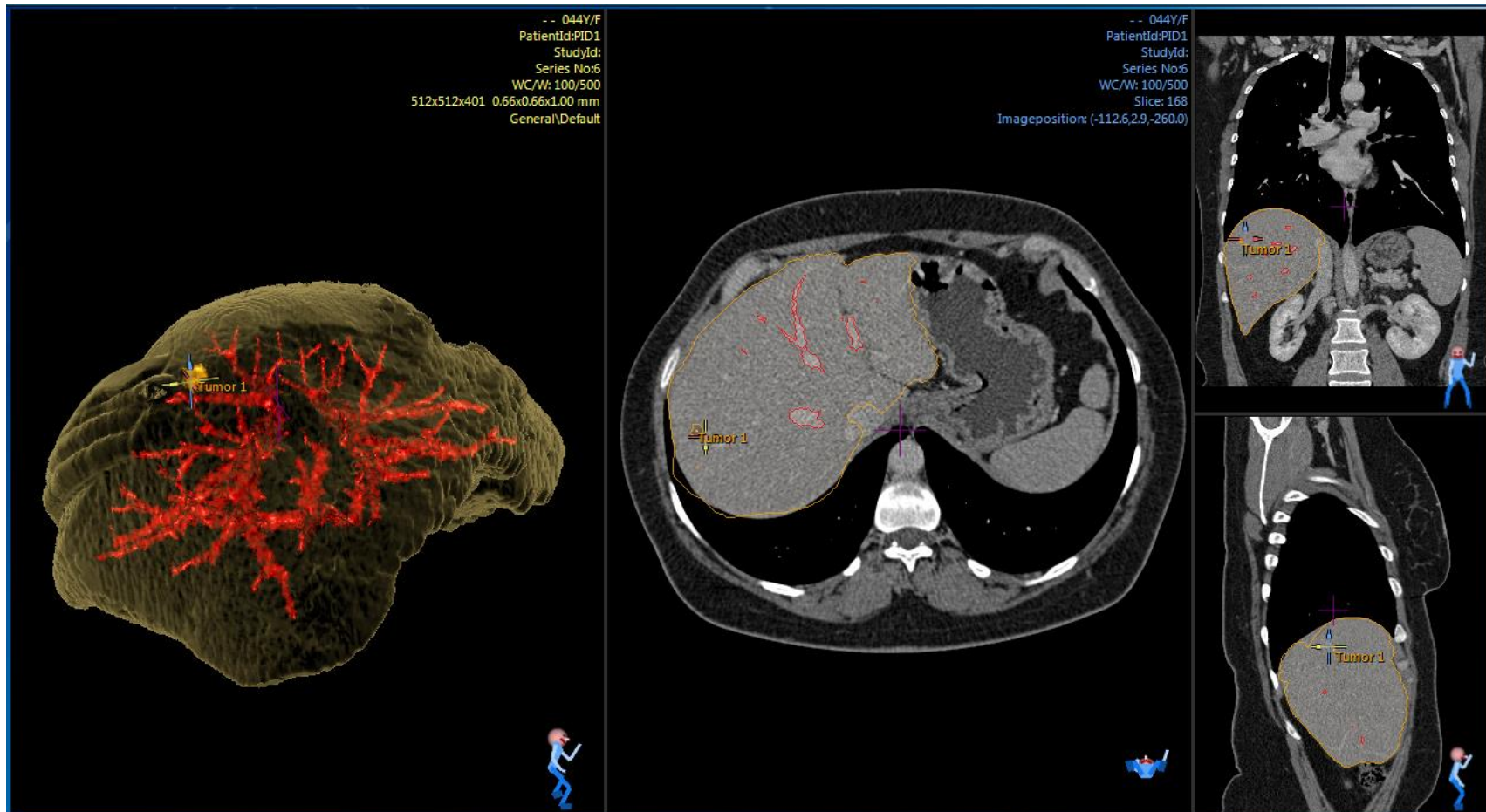
- Quality of liver , vessels and tumor segmentation (1=poor, 5= excellent)
- Ablation planning time

Materials and Methods

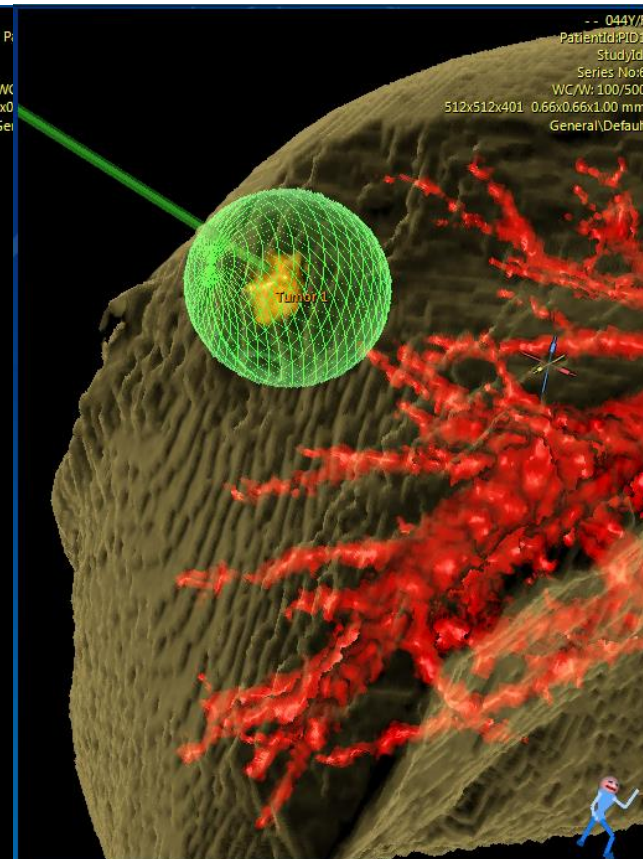
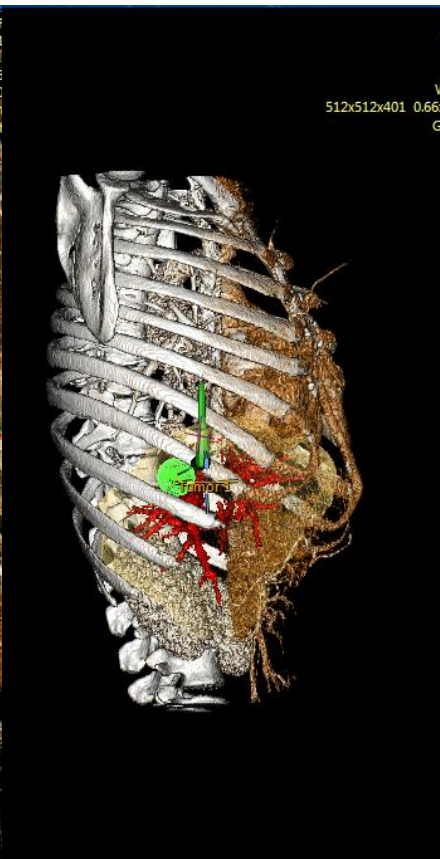
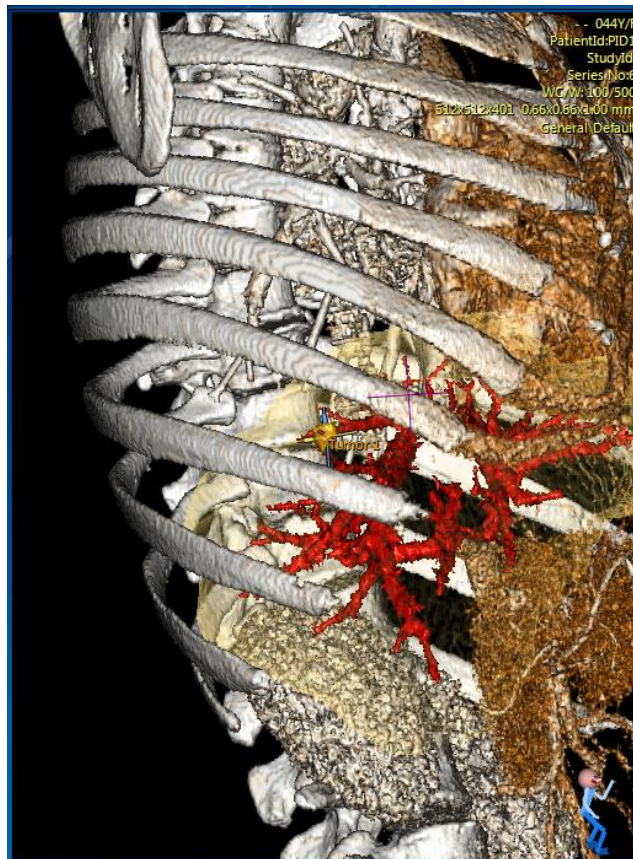
- **18 liver CRC mets in 16 CT studies**
 - Lesion size (mean 18.7 mm, median 16.5 mm)
- **RF ablation as standard procedure, MW available**
- **6 ablation protocols**
 - RF (straight/expandable)
 - MW (power, duration, overlapping)
- **Manual planning**
- **Robotic-assisted planning, Maxio™ software, Perfint Healthcare Corporation**



MAXIO™ :Segmentation



MAXIO™: Planning

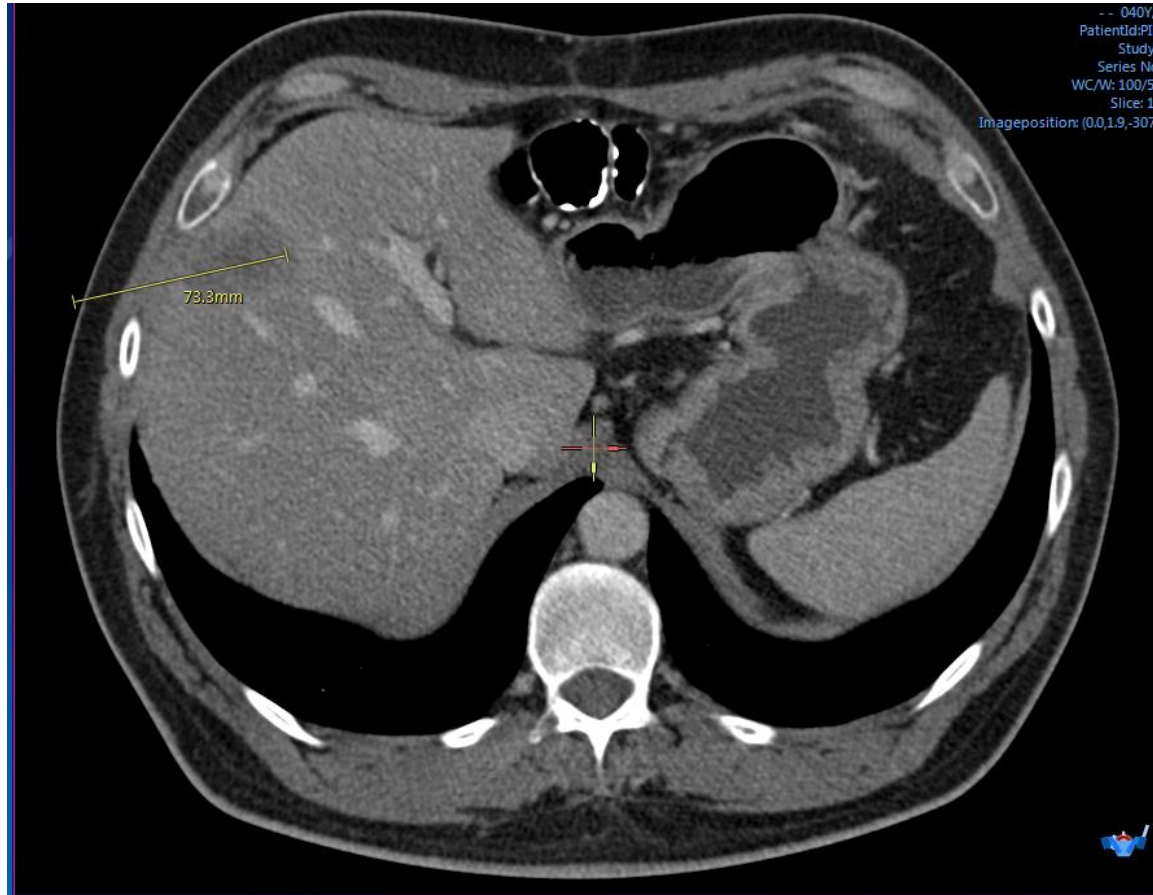


Results: Primary endpoints

Change in ablation strategy (18 lesions)		
<i>Change in ablation protocol</i>	<i>Change in entry point</i>	<i>Any change</i>
9/18 (50%)	7/18 (39%)	11/18 (61%)

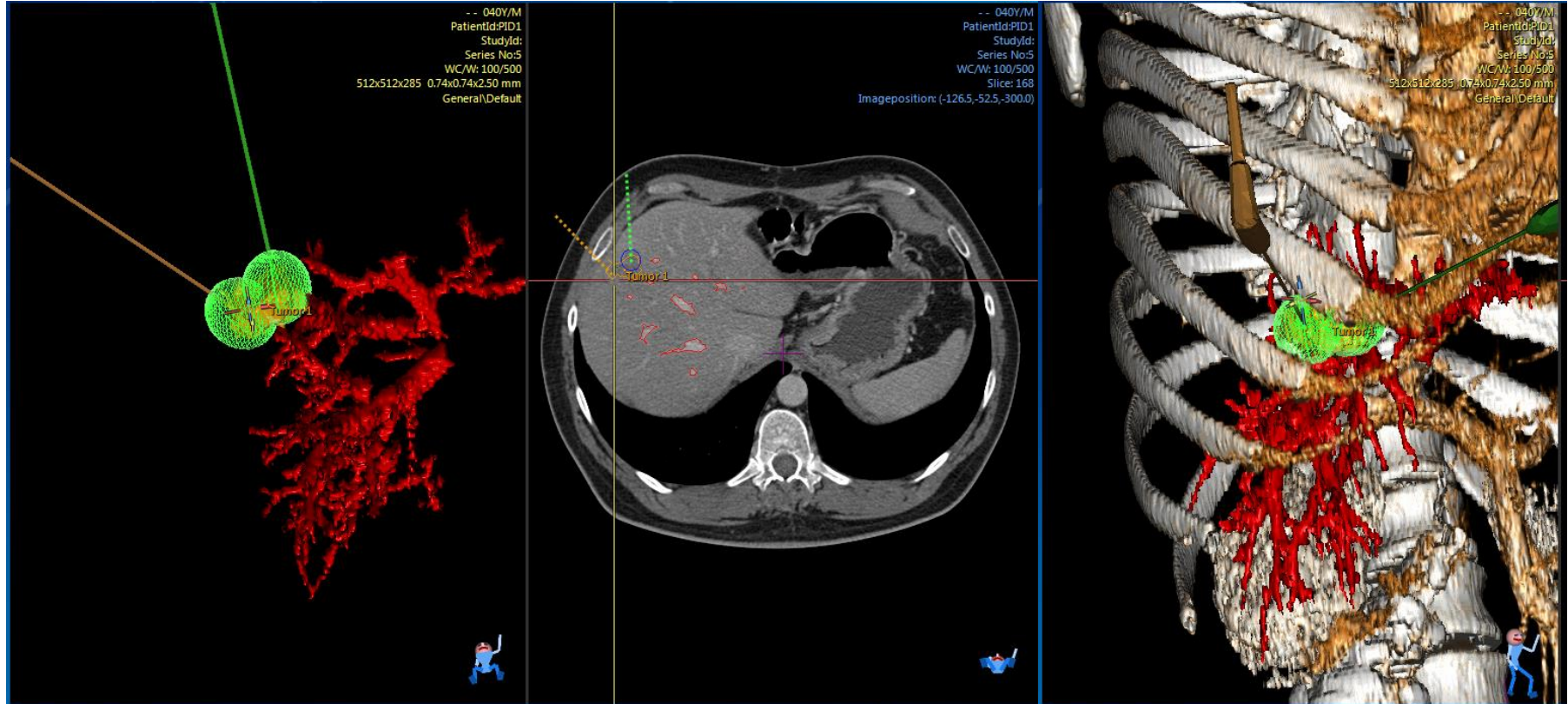
- RF ablation according to manual planning changed to MW ablation with Maxio planning in 3 cases
- MW ablation according to manual planning changed to RF ablation with Maxio planning in 1 case

Results: Lesion # 15



- **Manual planning:**
RF ablation with expandable needle, 5 cm deployment

Results: Lesion # 15



Maxio planning: MW overlapping ablations, 120W, 4 min

Results: Secondary end-points

Lesion	Ablation planning time (min)		Quality of segmentation		
	Manual	Maxio	Liver	Tumor	Vessels
01	3	20	4 *	4	5
02	2	18	4 *	5	5
03	4	19	4 *	5	5
04	3	16	5	5	5
05	3	15	5	5	5
06	4	18	4	4 **	5
07	2	15	5	5	5
08	2	15	4 *	5	5
09	2	9	5	5	5
10	3	10	5	5	5
11	2	6	5	5	5
12	3	13	5	5	4 †
13	4	11	5	4	5
14	2	7	5	4 ***	5
15	2	12	5	5	5
16	4	10	5	5	4 †
17	2	8	5	5	4 †
18	3	12	5	5	5

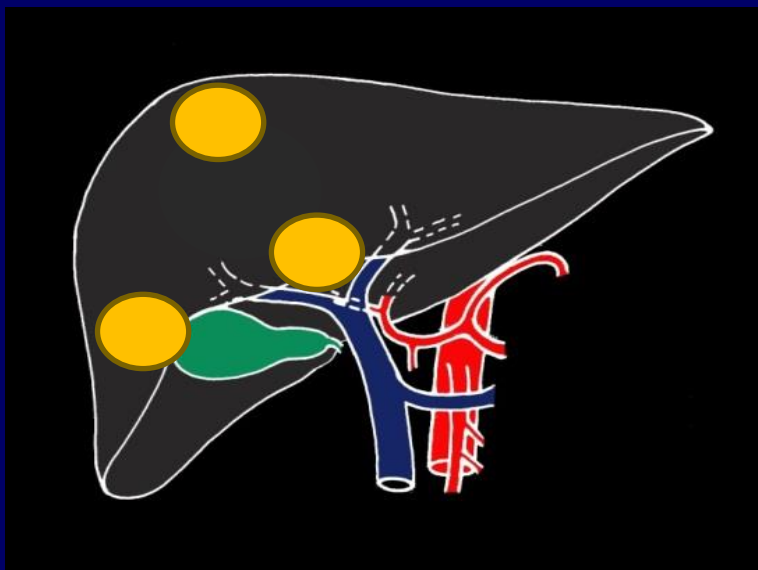
* previous hepatic resection

*** massive internal calcification

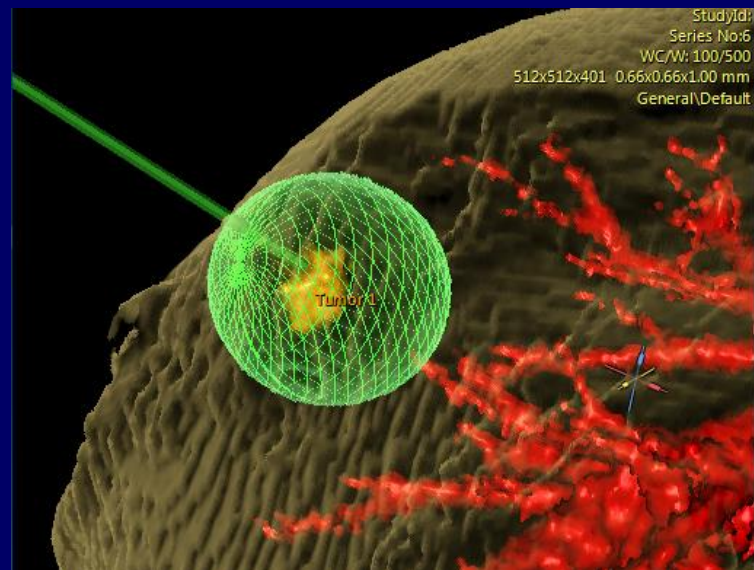
† poor iv contrast

** massive internal necrosis

Customizing ablation, the recipe of success?



Appropriate ablation strategy



Appropriate imaging planning