

# 3DGPS: A 3D Differentiable-Gaussian-based Planning Strategy for Liver Tumor Cryoablation

Supplementary material

Table 1: The rating level of RE decided by clinical surgeons.

Score	Physician rating rationale
5	Ideal or near-ideal pathway.
4	Good, but not a quite ideal pathway.
3	Potential pathway if necessary, but better pathways are available for safety or technical reasons.
2	Dangerous or technically challenging pathway.
1	Extremely dangerous (ie, potentially fatal) or technically extremely challenging pathway.

Table 2: The RE score and corresponding scoring reason.

LiTS	Plan	NP	ATR $\downarrow$ (%)	RE $\uparrow$ (1-5)	Analysis
P7	A	4	76.40	2	Relatively higher AE; one ablation zone is larger; posing technical challenges.
	B	3	<b>58.03</b>	<u>4</u>	Long ablation pathway.
	C	4	<u>61.52</u>	<b>5</b>	Ideal pathway.
P9	A	3	69.44	<u>4</u>	Relatively higher AE.
	B	1	72.72	<u>4</u>	Relatively higher AE.
	C	4	<b>58.83</b>	<b>5</b>	Near-ideal pathway.
P17	A	4	<u>55.61</u>	<u>4</u>	Relatively higher number of cryoprobes.
	B	1	<b>54.93</b>	<b>5</b>	Ideal pathway.
	C	1	<b>54.93</b>	<b>5</b>	Ideal pathway.
P19	A	4	91.16	<b>4</b>	Relatively higher AE.
	B	2	89.53	<b>4</b>	Relatively higher AE.
	C	3	<b>83.28</b>	<b>4</b>	Relatively higher number of cryoprobes.
P69	A	4	<u>57.02</u>	<u>1</u>	Traverses a rib.
	B	3	82.85	<b>4</b>	Relatively higher AE.
	C	4	<b>54.07</b>	<b>4</b>	Relatively higher number of cryoprobes.
<b>IH</b>	Plan	NP	ATR $\downarrow$ (%)	RE $\uparrow$ (1-5)	Analysis
P1	A	4	<u>62.17</u>	1	Traverses a rib
	B	3	63.09	3	Ablation zone is too close to the ribs
	C	4	<b>56.69</b>	4	Relatively higher number of cryoprobes