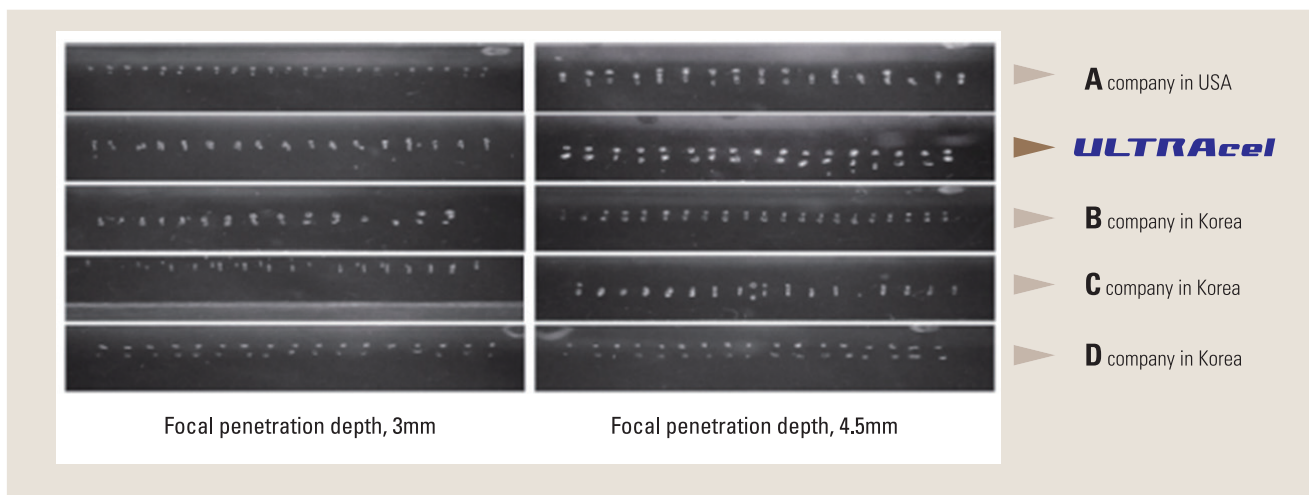


# Coagulation and ablation patterns of high-intensity focused ultrasound on a tissue-mimicking phantom and cadaveric skin

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We performed a comparative study of HIFU, evaluating patterns of focused tissue coagulation and ablation on tissue mimicking phantom and cadaver using the five HIFU devices included ULTRAcel. This article is published in Lasers in Medical Science. Following summarization is in regard to ULTRAcel only.

## 1. HIFU treatment on tissue-mimicking phantom



To analyze geometric patterns of TIZs induced by HIFU treatment, we initially examined treatments with the five HIFU devices on TM phantom due to its homogeneous composition. All HIFU devices generated remarkable TIZs in TM phantom with different patterns of coagulation, and most TIZs seemed to be separated into two or more tiny portions.

**Table 1** : Effects of high-intensity focused ultrasound on tissue-mimicking phantom

	3-mm focal depth					4.5-mm focal depth				
	Frequency, MHz	TIZs				Frequency, MHz	TIZs			
		Number	Inter-TIZ distance <sup>a</sup>	TIZ width <sup>a</sup>	TIZ height <sup>a</sup>		Number	Inter-TIZ distance <sup>a</sup>	TIZ width <sup>a</sup>	TIZ height <sup>a</sup>
A in USA	7	23	1.126±0.057	0.314±0.064	0.613±0.287	4	17	1.440±0.124	0.357±0.062	1.304±0.342
<b>ULTRAcel</b>	7	17	1.532±0.223	0.444±0.115	1.110±0.229	7	17	1.507±0.193	0.576±0.123	1.802±0.529
B in Korea	7	17	1.512±0.503	0.497±0.202	1.080±0.508	4	22	1.091±0.114	0.358±0.061	0.955±0.175
C in Korea	7	21	1.230±0.460	0.300±0.164	0.786±0.376	4	17	1.346±0.295	0.452±0.245	1.231±0.318
D in Korea	7	17	1.483±0.188	0.637±0.115	1.223±0.362	4	17	1.510±0.182	0.635±0.160	1.564±0.115

<sup>a</sup>Data are presented as estimated mean±standard variation(in millimeter)  
TIZ thermal injury zone

The numbers of TIZs formed and the mean inter-TIZ distance, as well as the mean height and width of the TIZs, are summarized.

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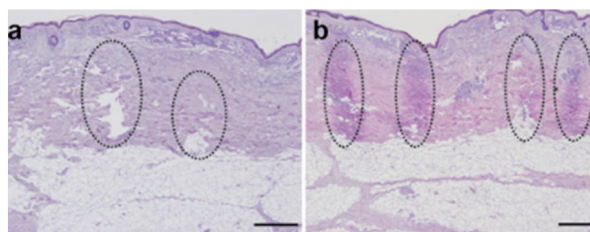
The thermal injury zones of ULTRAcel are **clearer and bigger** than those of other devices.

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## 2. Skin coagulation and ablation patterns for HIFU treatments

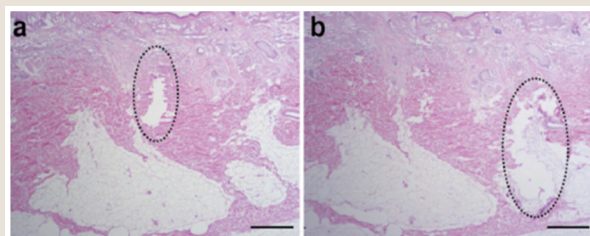
At a focal depth of 3-mm

A company



cadaveric skin samples were treated with each HIFU device. Skin reactions with A company treatment characteristically presented HIFU-induced tissue ablation along the **lower dermis and dermo-subcutaneous interface**.

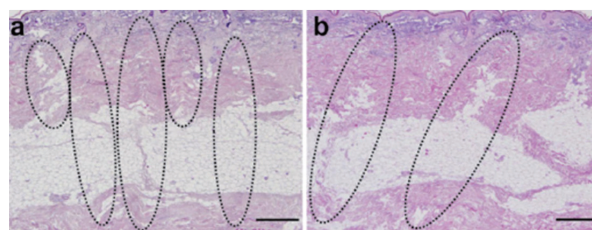
ULTRAcel



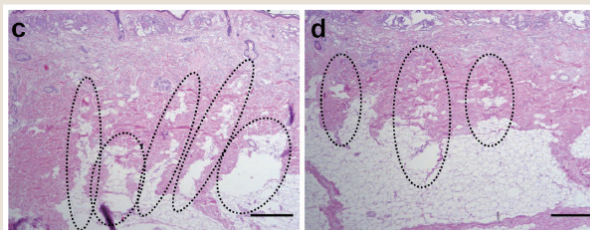
Cadaveric skin samples treated with **ULTRAcel** generated HIFU-induced ablative zones along the **lower dermis to the subcutaneous fat tissue**.

At a focal depth of 4.5mm

A company



ULTRAcel



**For ULTRAcel and A company treatment, cadaveric skin samples were treated a focal depth of 4.5 mm. The cadaveric skin presented zones of HIFU-induced coagulation along pre-focal areas in the mid dermis to the SMAS or the platysma muscle.**

### Reference :

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