Coming to you, Now





- Ultrasound-guided procedures: Necessity

In the field of dermatology and plastic surgery, the use of ultrasound facilitates to comprehend the skin anatomy and navigate the practitioners to target the precise skin layer during the minimally invasive procedures (e.g., botulinum toxin injection, filler injection, thread lifting), minimizing the adverse event rates and enhancing the efficacy.¹⁻⁴



For Botulinum Toxin injection procedure

- The targeted facial area for botulinum toxin injection has **ambiguous borders surrounded by** various muscle layers and fat, and it is difficult to detect the precise anatomical location for injection.¹
- Ultrasound-guidance during botulinum toxin injection allowed knowing in advance the presence of anatomical variants of the salivary glands and confirming the exact location of masseter muscle that blind procedure did not mark correctly.⁵ Further, ultrasound-guided botulinum toxin injection showed a significantly greater accuracy over blind injection for the overall procedures (parotid and submandibular glands).⁶

		No. of injections	Accuracy		Durahua
Accuracy of			Blind	Ultrasound-guided	P-value
Ultrasound-guided	Parotid gland				
injection vs	Site A				
Blind procedure ⁶	Physician 1	6	4 (66.67)	6 (100)	
·	Physician 2	6	5 (83.33)	6 (100)	
	Site B				
	Physician 1	6	5 (83.33)	6 (100)	
Values are presented as number (%). Site A location for parotid gland injection behind the ascending mandibular ramus; Site B, location for parotid gland injection infero-posterior portion of the gland just before the mastoid process	Physician 2	6	5 (83.33)	5 (83.33)	
	Total	24	19 (79.17)	23 (95.83)	0.081
	Submandibular gland				
	Physician 1	6	2 (33.33)	6 (100)	
	Physician 2	6	4 (66.67)	5 (83.33)	
	Total	12	6 (50.00)	11 (91.67)	0.025
	Overall	36	25 (69.44)	34 (94.44)	0.006

Oltrasound during botulinum toxin injection enables to

- 1 visualize the anatomical structure adjacent to the target layer,
- 2 capture the dynamic muscle movements in real-time, and
- 3 perform an ultrasound-guidance injection.14

For Hyaluronic acid filler injection procedure

• Ultrasound-guided filler injection could assist the practitioners to identify the precise location of previously injected filler, inject the minimal amount of filler into the target skin layer and lower the complication rates (e.g., dermatopathy, filler migration, vascular complication) by inspecting the vessels in real-time via ultrasound doppler mode.¹⁷⁸



For Thread lifting procedure

• Ultrasound guidance allows for identification of anatomical structures and insertion of thread into the target skin layer during a non-surgical aesthetic thread lifting procedure where it is impossible to visually detect the SMAS layer.¹

Ultrasound-guided applications in dermatology and plastic surgery

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SONON could serve as a navigation aid for effective and safe procedures in dermatology and plastic surgery.





Guideline for Skin Ultrasound

Ultrasound by skin structure

· Echogenicity, the degree of reflecting or transmitting the ultrasonographic waves from the inner body, varies by the target tissue and the medium type of the surrounding tissue.¹

When the probed tissues produce similar images as the surrounding structuresWhen the images are shown dark as no echoes are reflected from the tissue [vessels, filler materials]When the reflected echoes are weak compared to the surrounding tissue, demonstrating (muscle, cartilage)When the echoes are strong compared to the surrounding tissue, appearing white [ligament, fasciae, surface of the bone]	Isoechoic	Anechoic	Hypoechoic	Hyperechoic
	When the probed tissues produce similar images as the surrounding structures	When the images are shown dark as no echoes are reflected from the tissue [vessels, filler materials]	When the reflected echoes are weak compared to the surrounding tissue, demonstrating as dark gray color [muscle, cartilage]	When the echoes are strong compared to the surrounding tissue, appearing white [ligament, fasciae, surface of the bone]

Instructions for skin ultrasound

- · When scanning the skin tissue, the echo gel should be applied sufficiently for obtaining ultrasound images without any direct contact or pressure between the transducer and the skin.⁹
- · A copious amount of echo gel provides appropriate ultrasound wave conductance while enhancing sensitivity by evenly distributing the probe pressure on the skin.¹⁰



Transducer should be firmly supported by other fingers that are not holding the transducer as above.

When scanning the facial nerve or vessels, scanning should be done without pressing with a transducer for getting a clear image of target tissue (left).



Portability

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· Patient : No need of patient transport for ultrasound scanning • Device : No risk of shortening the device lifespan caused by vibration

Economy

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References 1. Kim HJ et al. 초음파를 이용한 최소 침습 얼굴해부학. 2. Davidovic K et al. To click or not to click-The importance of understanding the layers of the forehead when injecting neuromodulators-A clinical, prospective, interventional, split-face study. J Cosm Dermatol. 2021;20(5):1385-1392. 3. Cho Y et al. Ultrasonographic and Three-Dimensional Analyses at the Glabella and Radix of the Nose for Botulinum Neurotoxin Injection Procedures into the Procerus Muscle. Toxins. 2019;11(10):560. 4. Wu WT et al. Ultrasound Imaging of the Facial Muscles and Relevance with Botulinum Toxin Injections: A Pictorial Essay and Narrative Review. Toxins. 2022/14/101. 5. Quezada-Gaon N et al. Comparison of clinical marking and ultrasound-guided injection of Botulinum type A toxin into the masseter muscles for treating bruxism and its cosmetic effects. J Cosm Dermatol. 2016;15(3):238-244. 6. So JI et al. Accuracy of Ultrasound-Guided and Non-ultrasound-Guided Botulinum Toxin Injection Into Cadaver Salivary Glands. Ann Rehab Med. 2017;41(1):51–57.7. Schelke LW et al. Ultrasound to improve the safety of hyaluronic acid filler treatments. J Cosm Dermatol. 2018;17:1019–1024. 8. kard RL. Image Guided Dermatologic Treatments. Springer Nature. 2019. 9. Choi YJ et al. Ultrasoungraphic Analyses of the Forehead Region for Injectable Treatments. Ultrasound Med Biol. 2019;45(10):264– 2648.10. Wortsman X et al Clinical usefulness of variable-frequency ultrasound In localized lesions of the skin. J Am Acad Dermatol. 2010;62247-256.11, Falkowski AL et al. Hand-held portable versus conventional cart-based ultrasound in musculoskeletal imaging. Orthop J Sports Med. 2020;8(2):2325967119901017

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