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HIGH-FREQUENCY ULTRASOUND SCANNING IN EYELIDS ASSESSMENT

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Disclosures of financial relationships

The authors have no financial interests to disclose

METHODS OF EXAMINATIONS OF EYELIDS

1. Non-instrumental methods

History taking

External inspection, palpation

2. Laboratory methods (immunological, biochemical, bacteriological)

METHODS OF EXAMINATIONS OF EYELIDS

3. Instrumental methods of examinations

Optical methods

- Slit lamp biomicroscopy
- Optical coherent tomography
- Reflective and fluorescence spectroscopy
- Confocal laser-scanning microscopy

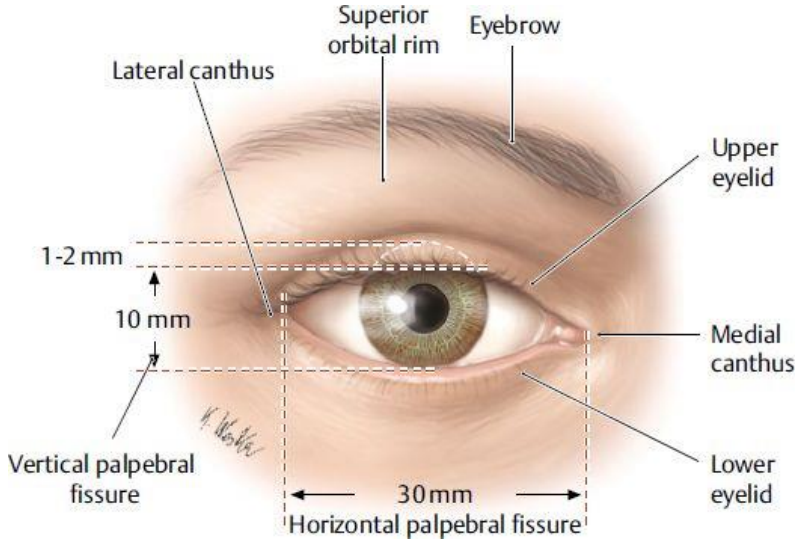
Radiological methods

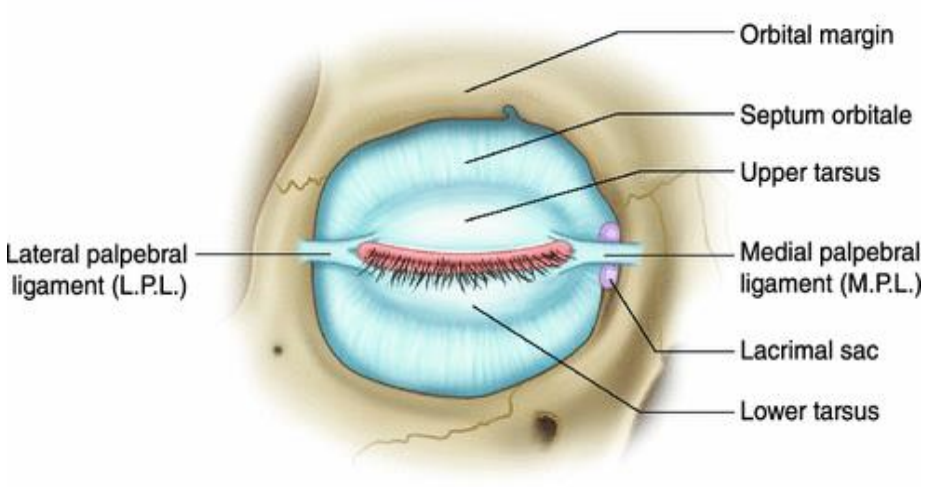
- Ultrasound methods
- CT
- MRI
- Scintigraphy

Fine needle aspiration biopsy

PURPOSE

to study the normal ultrasound image of anatomical structures of eyelids using high-frequency ultrasound scanning





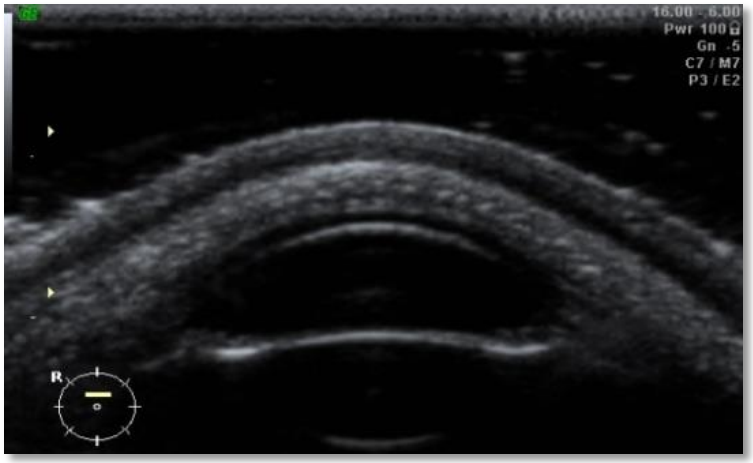
METHODS OF EXAMINATIONS

48 healthy volunteers (96 eyes) aged from 17 to 46 years were observed using Voluson diagnostic system (GE Healthcare) and linear transducer SP 10-16 MHz with the high resolution zoom function

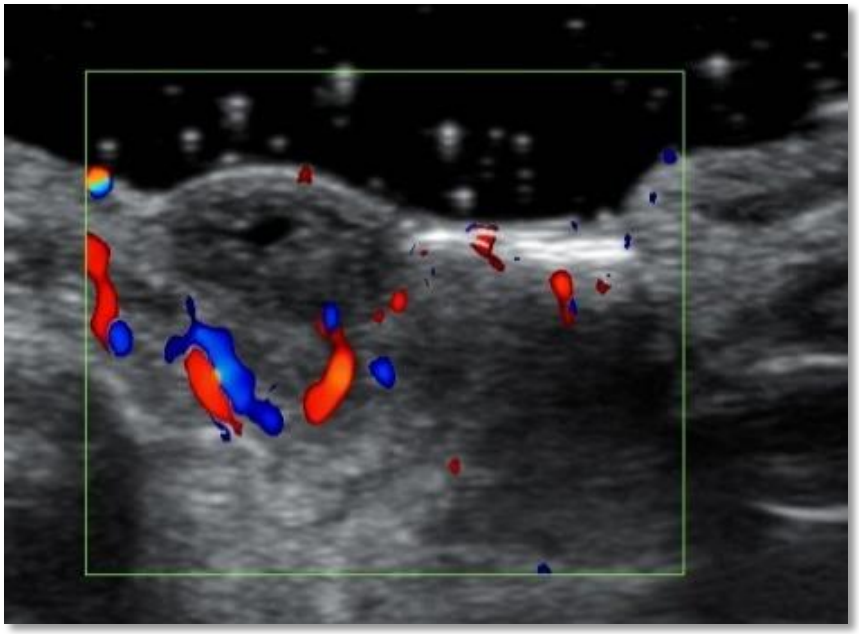
Ultrasound methods:

- high-frequency grayscale B-scan
- Color Doppler imaging (CDI)
- echodensitometry (ED) of eyelids and periorbital tissues

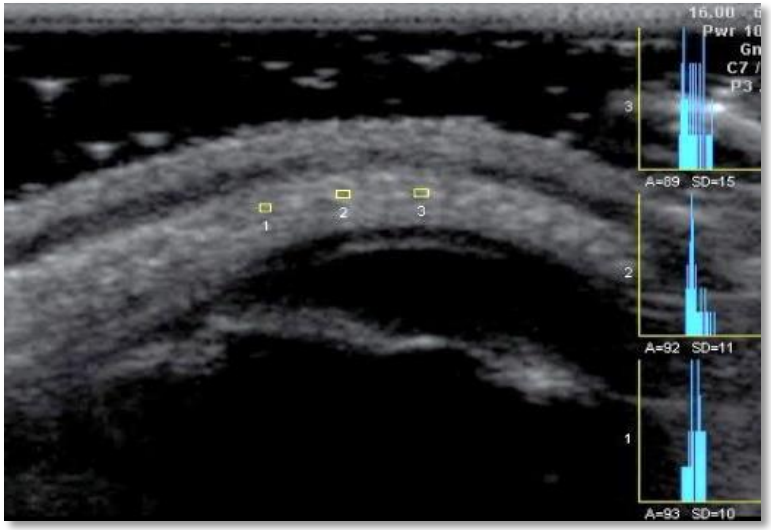
ULTRASOUND METHODS OF EYELID EXAMINATION



B-scan

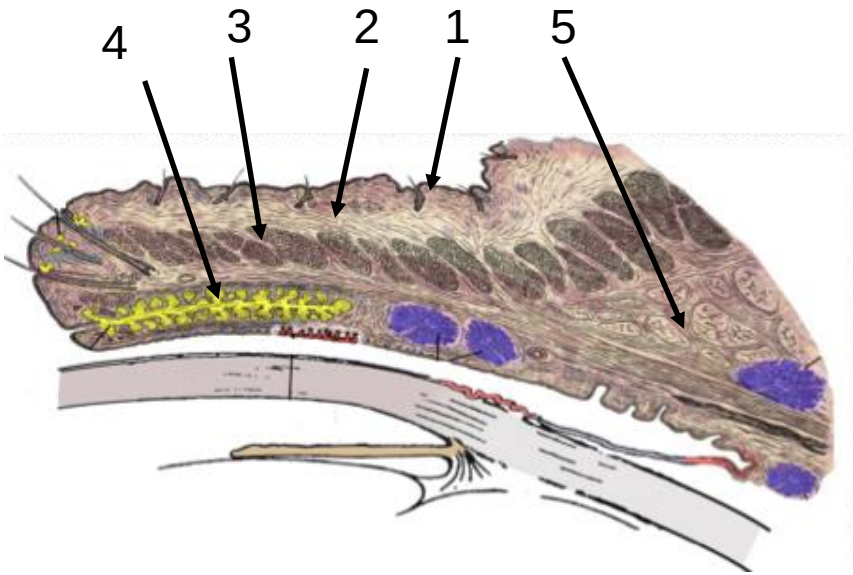


Color Doppler Imaging

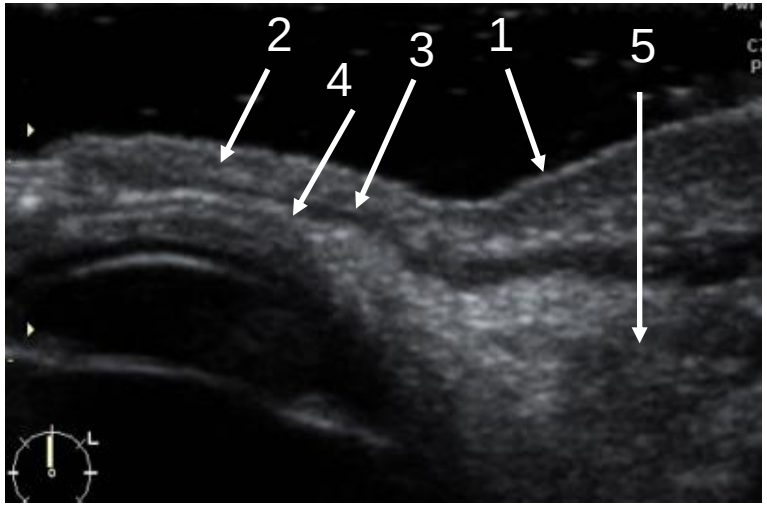


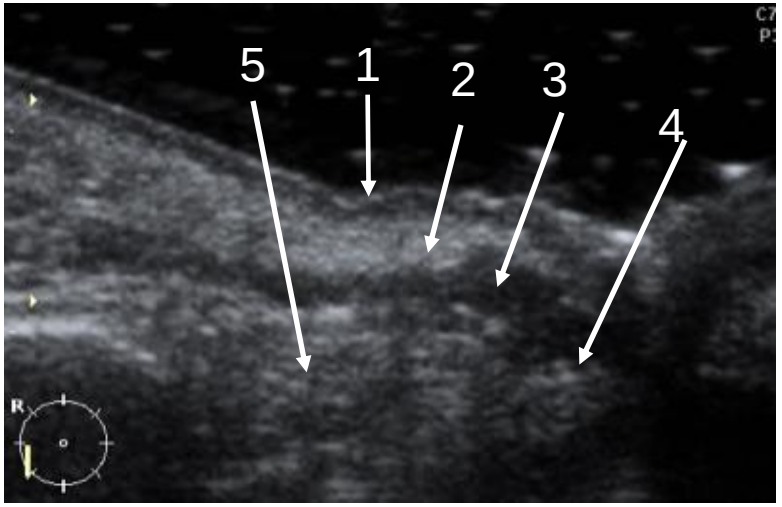
Echodensitometry

RESULTS



1 – skin
2 – subcutaneous tissue
3 – orbicularis oculi muscle
4 – tarsal plate
5 – orbital fat



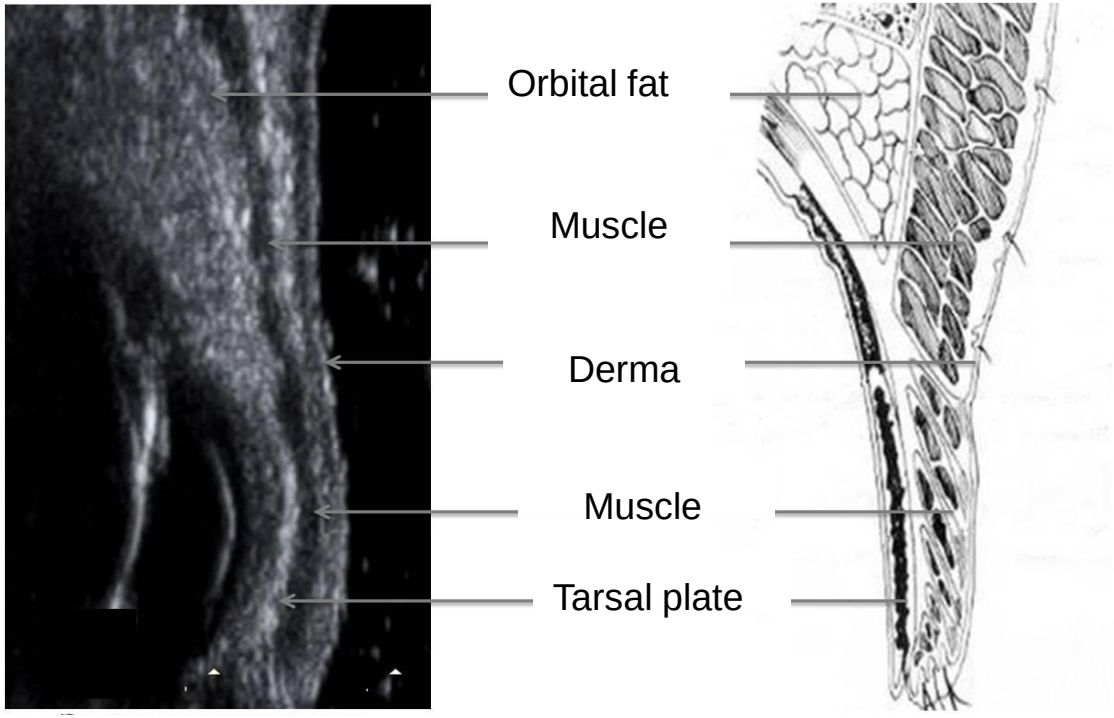


RESULTS

Echographic image of eyelids

Hyperechoic layers: epidermis, reticular layer of derma, orbital fat, tarsal plate with conjunctiva

Hypoechoic layers: papillary layer and orbicularis oculi muscle

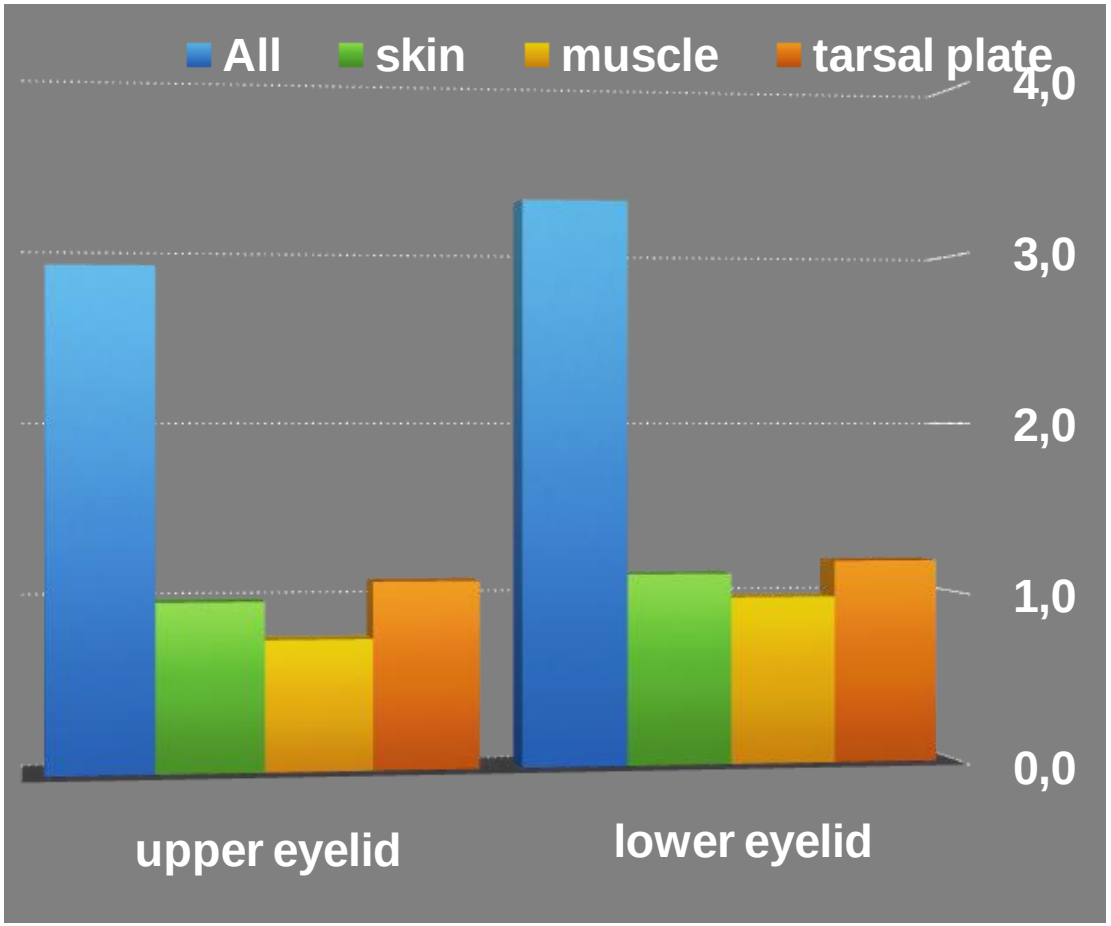


Echogram of upper eyelid

Anatomy of upper eyelid

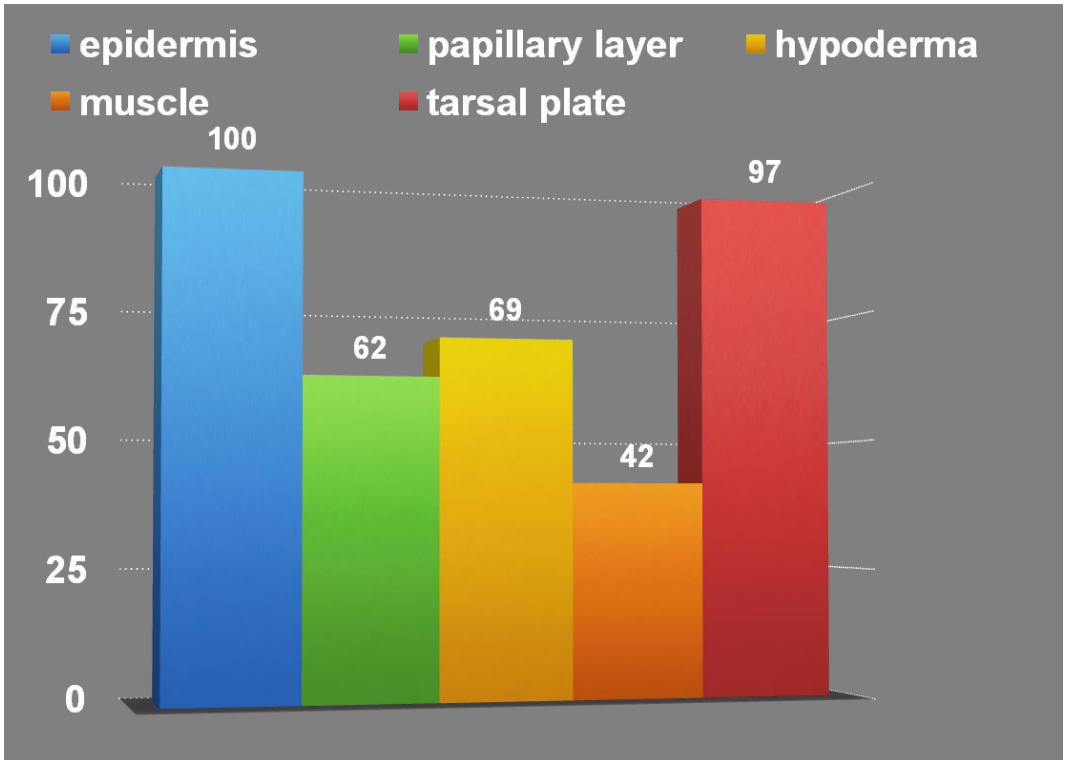
RESULTS

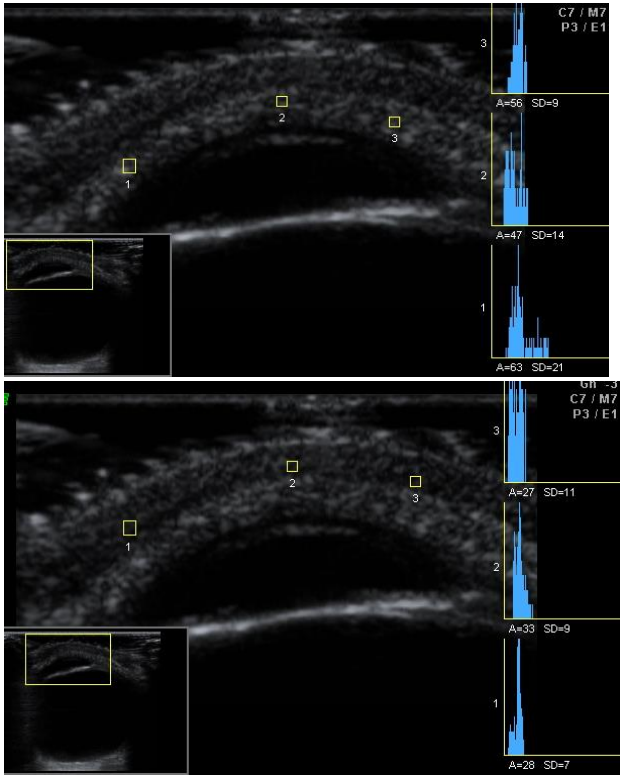
Indices of thickness of eyelids (mm)



RESULTS

Indices of echo densitometry of eyelids (c.u.)

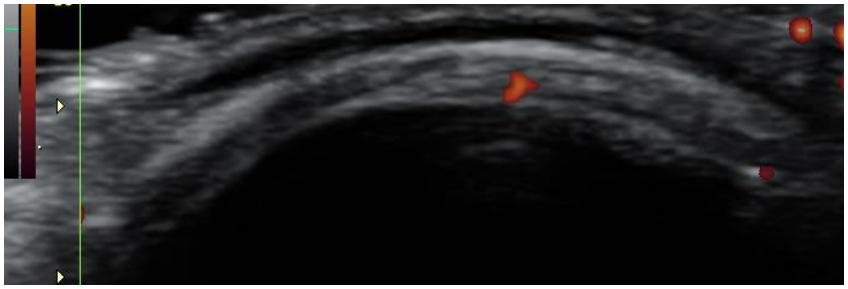




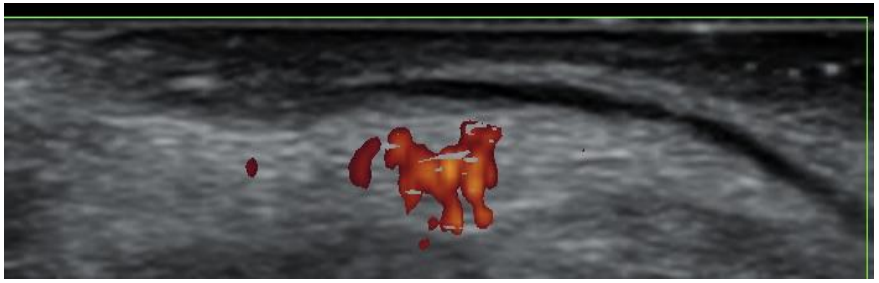
There was no statistically significant difference between ultrasonic density indices of the upper eyelid layers and the lower ones ($p>0,05$)

RESULTS

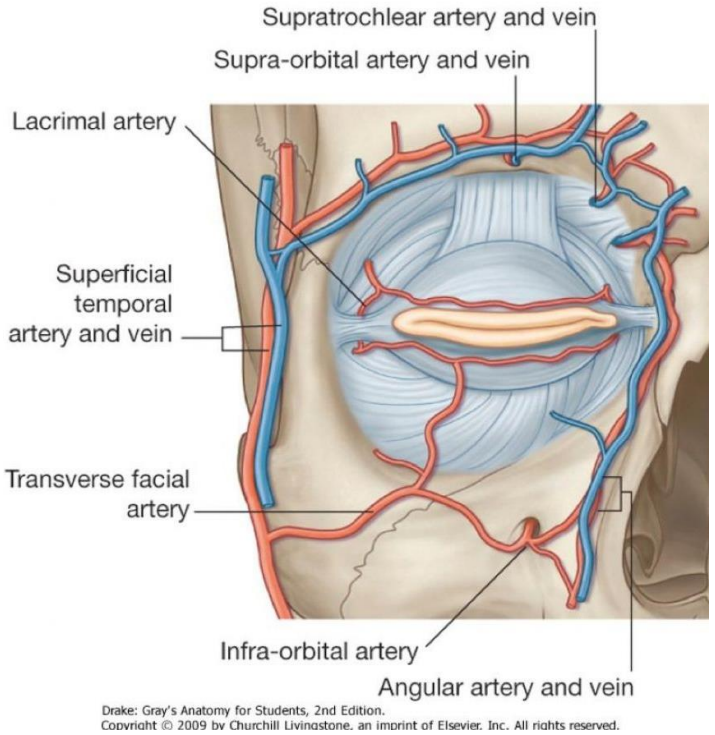
Color Doppler Imaging



Power Dopler image of upper eyelid



Power Dopler image of lower eyelid



Vessels with low blood flow velocity between anterior and posterior lamella of eyelid

CONCLUSION

- Based on echographic detailed identification of normal anatomic features of eyelid structures, complex ultrasound examination including high frequency B-scan, echodensitometry and CDI can be used successfully in clinical practice

- High frequency ultrasound scanning of eyelids can be recommended prior to reconstructive and plastic surgery in order to facilitate the choice of surgical tactics