with rhinophyma. The subunit method should be considered if (1) cartilaginous modification is required (ie, external valve collapse), (2) secondary healing is contraindicated, or (3) partial excisional techniques have failed to achieve satisfactory nasal contour.

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Ex vivo high-frequency ultrasound: A novel proposal for management of surgical margins in patients with non-melanoma skin cancer

To the Editor: High-frequency ultrasound (HFUS) is a non-invasive technique that allows visualizing skin tumors in vivo to obtain size, shape, and tumor volume.[1] In this study, we sought to measure the correlation between ex vivo HFUS and histopathology surgical margins.

This was a prospective, single-blinded study. All patients had been sent for skin tumor excision. We excluded patients <18 years of age, and written informed consent was obtained. Tumors could not exceed 13 mm in length or 8 mm in depth with in vivo HFUS, as these are the maximum dimensions assessed by our equipment. HFUS was performed with a 22 MHz Ultrasound (Taberna ProMedicum, Lüneburg, Germany) before and immediately after excision to determine length (longest axis) and depth. Ex vivo HFUS was performed on the specimen placed on gauze with the epidermis face up and covered with ultrasound gel. Tumor measurements and surgical margins (SM) were evaluated (Fig 1). SM were established by observing echogenicity differences and tumor shape. The pathologist was blinded to HFUS measurements and SM. An approximate value of the tumor area was obtained using the formula for ellipses ($A = \pi ab$).

A total of 100 tumors were analyzed in 89 patients (52 males, 37 females; mean age, 74.37 ± 18.21 years). The histology diagnosed 84 as malignant: 79 basal cell carcinoma (BCC; 56 nodular, 15 superficial, and 8 with more than one histological subtype) and 5 squamous cell carcinoma (SCC); 16 were benign lesions (7 nevi, 5 dermatofibromas, and 4 cysts). Out of 84 malignant tumors, 81 had a correspondence between ex vivo HFUS and histology (77 had negative and 4 had positive SM by ex vivo HFUS and histology). Of the remaining 3 tumors, one had uncertain and 2 had negative SM by ex vivo HFUS while positive SM by histology (Table I).

When histology and ex vivo HFUS tumor area were compared, a moderate correlation ($R^2 = 0.4940$) was found. Ex vivo and in vivo areas based on HFUS also had a moderate correlation ($R^2 = 0.5524$).

All the measures obtained by histological study tend to be smaller than HFUS results, probably due to shrinkage caused by dehydration during the laboratory process.[2] In vivo and ex vivo tumor areas were comparable; however, the tumor shapes could appear distorted due to ex vivo tissue manipulation. When tumor area is calculated by approximation, the error is larger for irregular tumors (some superficial BCC and SCC), as reported by other authors.[3,4] In this study, ex vivo HFUS allowed correct visualization of negative SM in 81 of 84 malignant tumors. We considered that the direct evaluation of tumor shape and tissue echogenicity is the simplest way to assess SM with this technique.

Interestingly, BCC with more than one histological subtype has a higher recurrence rate.[5] Ex vivo HFUS could increase surgeon confidence on complete tumor excision by visualizing the tumor and SM.

HFUS devices are portable, and few materials are needed to measure ex vivo SM. Future studies are needed to compare ex vivo HFUS with other non-invasive technique such as dermoscopy, optical coherence tomography, and confocal microscopy.

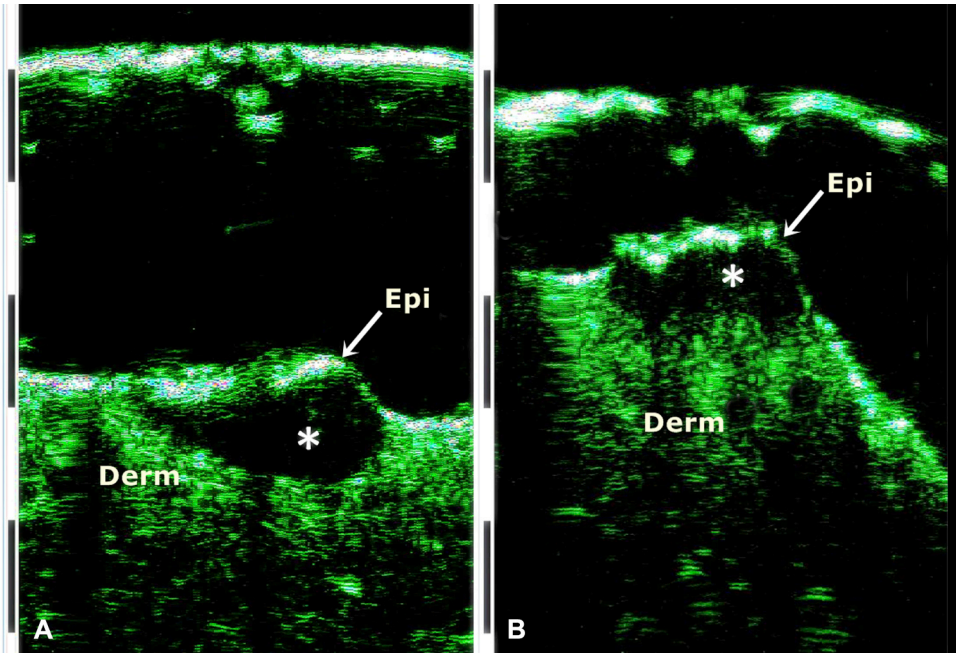

Fig 1. **A**, In vivo high-frequency ultrasound (HFUS) image of a nodular basal cell carcinoma (BCC); **B**, Ex vivo HFUS image of the same tumor. Note the different tumor shape obtain by ex vivo, well-demarcated hypoechoic tumor (*), epidermis (*Epi*), dermis (*Derm*), and the free surgical margins.

Table I. Cases with positive surgical margins by ex vivo HFUS and histology

Case	Gender	Age (years)	Ex vivo HFUS margins	Histology margins	Histological diagnosis
1	M	86	+ Lateral	+ Lateral	BCC with more than one histological subtype
2	M	86	+ Lateral	+ Lateral	Superficial BCC
3	M	80	+ Deep	+ Deep	BCC with more than one histological subtype
4	F	88	+ Deep	+ Deep	Nodular BCC
5	M	91	−	+ Deep	Nodular BCC
6	M	72	Uncertain	+ Lateral	Superficial BCC
7	M	41	−	+ Lateral	BCC with more than one histological subtype

BCC, Basal cell carcinoma; *F*, female; *HFUS*, high-frequency ultrasound; *M*, male.

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Utilizing the Patient Attitudes to Scarring Scale (PASS) to develop an outcome measure for postoperative scarring: A study in 430 patients

To the Editor: Dermatologists perform more cutaneous surgical excisions than any other specialist group in the United States[1]; therefore, developing meaningful outcome measures—and ultimately core outcome measures and outcome sets—is of vital importance to clinical research in our field.[2] Currently, several scales exist to assess postoperative scarring. The Patient and Observer Scar Assessment Scale and the Vancouver Scar Scale are 2 of the most frequently used scales for postoperative scarring in dermatology[3,4]; while these scales provide useful information, both were originally developed for burn scar evaluation rather than for assessing linear postoperative scars, and neither scale was developed through eliciting patient input regarding esthetic priorities. The clinical appearance and healing of burn scars often differ significantly from postoperative scars. Indeed, little if any research has been published on patient concerns and perceived functional outcomes regarding postoperative scarring; while patient concerns may not mirror the clinical likelihood of complications, they should be considered when designing a meaningful scale.[5] Moreover, the myriad components that putatively contribute to scar formation and cosmesis mean that an overly broad and comprehensive scale may be clinically unusable, while an unnecessarily focused scale may capture too little clinical information.[6] We developed the 9-point Patient Attitudes to Scarring Scale (PASS) to determine what dermatology patients view as the most important facets of postoperative scarring in order to incorporate patient preferences into a novel scar rating scale. This scale is available at http://www.jaad.org.

An iterative process was used to develop the PASS, which was subsequently pretested in focus groups. The questionnaire was then pilot tested on a group of consecutive dermatology patients in the outpatient setting, including general dermatology, Mohs, and surgical dermatology patients. Because all patient responses were anonymous and demographic data were not linked to patient identifiers, institutional review board approval was not required.

Table I. Baseline subject characteristics

Baseline characteristic	Mean	95% Confidence intervals
Age	61.2	59.6, 62.8
Sex (% male)	45.8	41.0, 51.0
History of basal cell carcinoma (%)	38.5	33.8, 43.2
History of squamous cell carcinoma (%)	34.7	30.1, 39.3
History of melanoma (%)	9.2	6.4, 12.0
History of dysplastic nevi (%)	10.6	7.5, 13.7
History of prior dermatologic surgery (%)	59.1	54.4, 63.7
History of prior scar revision	0.23	0, 0.69

Table II. PASS responses including mean and 95% confidence interval data

PASS question	Mean rating	95% Confidence intervals
Redness	6.83	6.56, 7.10
Hyperpigmentation	6.37	6.09, 6.65
Hypopigmentation	5.99	5.70, 6.28
Pliability	6.50	6.02, 6.98
Thickness	7.27	6.99, 7.55
Contour	6.88	6.59, 7.16
Spread	7.01	6.72, 7.29
Pain	8.00	7.72, 8.27
Itch	7.66	7.39, 7.94
Overall appearance	7.32	7.04, 7.61

Overall, 430 of 500 consecutive patients agreed to participate in the survey, an 86% response rate. Baseline characteristics are reflected in Table I. Mean patient ratings for the various components of scarring were also recorded (Table II). Subjects believed that pain (8/10, with 10 being most important) and itch (7.66/10) were the most critical aspects of postoperative scarring. These were followed by scar thickness (7.27), scar spread (7.01), and scar contour (6.88).

Including all items in the scale, Cronbach's alpha was 0.91, suggesting excellent internal reliability, that is, the scale items correlated well with each other, implying they are indeed assessing the same outcome.

As a secondary analysis, patients were dichotomized into those who had (n = 254) or had not