C. Morales-Raya,* L. Maroñas-Jiménez, R. Aragón-Miguel, C. Postigo-Llorente

Servicio de Dermatología, Hospital Universitario 12 de Octubre, Madrid, Spain

* Corresponding author.
E-mail address: carlosmoralesraya@hotmail.com (C. Morales-Raya).
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Ultrasound Characterization of Psoriasis of the Nails: A Case-Control Study☆

Caracterización ecográfica de la psoriasis ungueal: estudio de casos y controles

To the Editor:

High-frequency B-mode ultrasonography and Doppler study can reveal changes in nail anatomy and vascularization in patients with nail psoriasis (NPs). The primary objective of this study was to describe thumbnail ultrasound findings in a series of adult patients with psoriasis involving the thumbnail. It was decided to focus on the thumbnail as this is the largest finger nail and also the one most often affected in NPs. A nonprospective, multicenter, cross-sectional case-control study was performed in which hospitals in 4 Spanish provinces participated. The controls were consecutive healthy subjects with no clinical disorders of the thumbnail who attended the dermatology clinic. The 5 investigators performed a single ultrasound study of each patient with the same parameters: 18 MHz linear transducer (B mode), between 6.6 and 12.5 MHz in Doppler mode, pulse repetition frequency of 750 per second and wall filter of 3. The structure and thickness of the nail plate as well as the thickness of the nail bed (distance between the ventral lamina and the phalange) were assessed along 2 axes, and Doppler signal of the nail bed and matrix area was assessed using a semiquantitative scale (0-3).[1] The nail bed was defined as the area located below the nail plate distal to the eponychium (cuticle) and the matrix area as the area located below the proximal fold that delimits proximally with the insertion of the extensor tendon of the thumb and distally with the nail bed. The statistical analyses were performed with the SPSS program, version 21.0, and statistical significance was set at 0.05.

Seventy-nine participants were included, 36 cases and 43 controls. The mean age was 44 years, 75% were women, and the mean body mass index was 25 kg/m^2, with no significant differences between the 2 groups. In patients with psoriasis, the mean age of onset of NPs was 32 years, the mean PASI was 5, 19% were diagnosed with peripheral psoriatic arthritis (PsA) (n = 7), and 30% were taking systemic treatment for NPs (54% methotrexate, 27% biologic agents, and 19% other agents). Of the cases, 72% had clinical involvement of the nail bed, 67% of the nail matrix, and 39% had involvement of both. The most frequent disorder was pitted nails (83%), followed by onycholysis (65%), and subungual hyperkeratosis (46%). Ultrasound of the nail plate showed a regular trilaminar structure in 95% of controls and 25% of cases ($P < .05$). In patients with NPs, plate thickening was observed (1.02 mm longitudinal axis and 1.08 mm transversal axis) and the nail bed (2.19 mm longitudinal axis and 2.21 mm transversal axis), with significant difference with controls (1.69 mm) (Table 1). The Doppler signal from the nail bed showed a mean and a mode of 1 in cases and 0 in controls ($P < .05$). The Doppler study of the matrix area of the cases showed a median of 1 and a mode of 2 while the controls showed a median of 1 and a mode of 0 ($P < .05$) (Fig. 1). Comparison of the ultrasound findings of the psoriatic patients with or without PsA did not show any significant differences.

In psoriatic patients, ultrasound changes in the nail plate, bed and matrix and in the insertion of the thumb extensor tendon have been observed.[1–6] Gisondi et al.[5] reported nail plate and bed thickening in patients with NPs, and our results were similar. Sandobal et al.[6] assessed the thickness of the nail bed of patients with NPs, PsA, rheumatoid arthritis, and controls, and established a cutoff of 2 mm (80% sensitivity and 71% specificity) as a predictive factor for NPs and PsA, and our study supported this finding. The present study assessed, for the first time separately the Doppler signal of the nail bed and matrix area, and statistically significant differences were obtained in both assessments with respect to controls. The present study has certain limitations. First is the technological limitation inherent in all ultrasound studies, whereby the more up to date the ultrasound system, the greater the sensitivity for Doppler

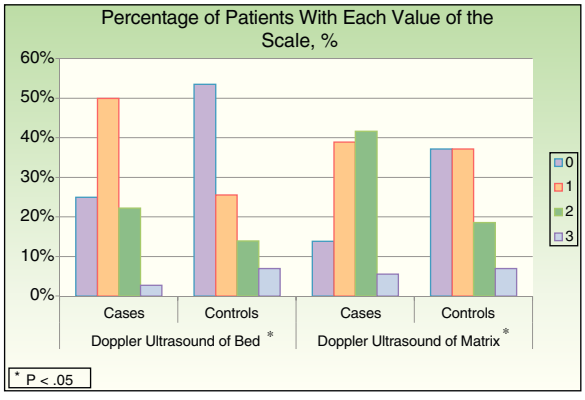

Figure 1 Doppler signal of the nail bed and matrix. Semiquantitative scale (0-3).
*$P < .05$.

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Table 1 Thickness of the Nail Plate and Bed in Millimeters.

	Maximum Thickness of Nail Plate		Maximum Thickness of Nail Bed	
	Longitudinal Axis (Min-Max)	Transverse Axis (Min-Max)	Longitudinal axis (Min-Max)	Transverse Axis (Min-Max)
Cases	1.02* (0.6-2.5)	1.08* (0.7-2.6)	2.19* (1.0-3.1)	2.21* (1.0-3.4)
Controls	0.69 (0.4-1.4)	0.77 (0.4-1.3)	1.69 (1.0-2.8)	1.69 (1.0-2.9)

* $P < .05$.

detection. Another limitation is the bias in the subgroups of psoriatic patients diagnosed with PsA and those receiving systemic treatment. There was a limited sample of these groups and there are biases such as time since diagnosis or treatment, severity of PsA, and dose of medication. In conclusion, the ultrasound findings of the thumbnail are significantly different between patients with NPs and healthy subjects.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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D. Vidal,[a,*] F. Alfageme,[b] R. Ruiz-Villaverde,[c] S. Arias-Santiago,[c] A. Martorell[d]

[a] *Servicio de Dermatología, Hospital de Sant Joan Despí Moisès Broggi, Sant Joan Despí, Barcelona, Spain*
[b] *Servicio de Dermatología, Hospital Universitario Puerta de Hierro-Majadahonda, Majadahonda, Madrid, Spain*
[c] *Unidad de Gestión Clínica de Dermatología, Complejo Hospitalario de Granada, Granada, Spain*
[d] *Servicio de Dermatología, Hospital de Manises, Manises, Valencia, Spain*

* Corresponding author.
E-mail address: david.vidal@sanitatintegral.org (D. Vidal).

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