







Progression must be suspected in ECTL with worsening of lymph node enlargement and/or occurrence of visceral (including neurological) manifestations, associated with blood eosinophilia and/or monocytosis, even if erythroderma and blood involvement are still controlled.

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## Is urinary incontinence associated with vulval lichen sclerosus in women? A cross-sectional study

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DEAR EDITOR, Increasing evidence suggests that the pathogenesis of male genital lichen sclerosus (LS) is driven by chronic, occluded exposure of susceptible epithelium to the irritant effect of urine.<sup>1,2</sup> It is not clear how this can be extrapolated to women; however, the typical 'figure of eight' distribution seen in female genital LS suggests that urine could be implicated. This has not yet been robustly investigated.<sup>3</sup>

This study utilized data prospectively entered into the East Lancashire Hospitals NHS Trust vulval dermatology database between 2017 and 2020. Cross-sectional analysis was performed to determine the odds of urinary incontinence (UI) in LS, compared with other genital conditions in adult female patients. The LS group comprised women with genital LS, diagnosed clinically and/or histologically. The non-LS group consisted of women with genital conditions other than LS, identified from the same clinic. UI was screened for using the validated International Consultation on Incontinence Questionnaire (ICIQ) Urinary Incontinence Short Form.<sup>4</sup> Power calculation demonstrated that for 90% power and 5% error to detect a 20% difference, 110 patients would be needed per group. Ethical approval was not required as the data were unlinked and anonymous.

All patients were assessed by a consultant dermatologist with a specialist interest in vulval disease. Clinical diagnosis (plus histological if available), demographics, body mass index (BMI), parity and ICIQ score were recorded.

Age was identified as an a priori confounder; BMI and parity were potential confounders.<sup>5</sup> The associations between potential confounders and LS and UI status were analysed using the two-sample t-test for normally distributed data or the Mann-Whitney U-test for non-normally distributed data. Univariate logistic regression was conducted to determine the association between LS and UI. Multivariable logistic regression using the 10% change in the adjusted odds ratio (OR) was used to assess for confounding and to obtain a final

Table 1 Baseline characteristics of the study participants

Variable	LS group		Non-LS group		P-value
	n = 126	Missing data	n = 258	Missing data	
Age (years)	62 (55–71)	0	50 (34–64)	0	< 0.001
Body mass index (kg m <sup>-2</sup> )	29 (25.5–33)	10	26 (23–32)	12	< 0.001
Parity	2 (2–3)	2	2 (0–2)	2	< 0.001
Self-reported UI, n (%)	79 (63)	2	87 (34)	3	< 0.001
ICIQ score	5 (0–11)	4	0 (0–5)	5	< 0.001
Washing frequency (per day)	1 (1–1)	0	1 (1–2)	6	0.047

The data are reported as the median (interquartile range), except for self-report of urinary incontinence (UI). ICIQ, International Consultation on Incontinence Questionnaire.

model, which included all confounders. Sensitivity analyses were conducted excluding patients with LS/lichen planus (LP) overlap and irritant contact dermatitis secondary to UI.

The most common diagnoses in the non-LS group were eczema, candidiasis, vulvodynia and irritant contact dermatitis. The baseline characteristics of all participants (n = 384) are presented in Table 1. The prevalence of UI was 63% in the LS group and 34% in the non-LS group,  $P < 0.001$ . Women with LS were significantly older (median 62 vs. 50 years,  $P < 0.001$ ). The LS group had higher BMI (median 29 vs. 26 kg m<sup>-2</sup>,  $P < 0.001$ ) and parity (both median 2, interquartile range 2–3 vs. 0–2,  $P < 0.001$ ). The LS group reported lower washing frequency per day than the non-LS group (both median 1, interquartile range 1–1 vs. 1–2,  $P = 0.047$ ).

Parity and BMI were significantly associated with both LS and UI status. Participants with missing data for these variables or UI status were excluded from the final analysis (n = 31); 353 participants were included in the multivariable analysis (LS n = 112, non-LS n = 241). BMI and parity were not found to be confounders using the 10% rule. The unadjusted OR for UI was 3.85 [95% confidence interval (CI) 2.40–6.18],  $P < 0.001$ . The final age-adjusted OR was 2.56 (95% CI 1.55–4.24),  $P < 0.001$ .

Sensitivity analysis excluding LS/LP overlap (n = 8) from the LS group increased the age-adjusted OR to 2.80 (95% CI 1.67–4.70),  $P < 0.001$ . When irritant contact dermatitis secondary to UI (n = 21) was excluded from the non-LS group, the OR was 3.15 (95% CI 1.87–5.30). Excluding both of these groups, the age-adjusted OR was 3.55 (95% CI 2.10–6.04),  $P < 0.001$ .

To our knowledge, this is the first study using a validated screening tool for UI and prospectively collected data, which is powered to determine the odds of UI in vulval LS. The prevalence of UI was 63% and the odds were increased 2.5-fold.

Few studies have reported the prevalence of UI in women with LS. A recent meta-analysis found a pooled prevalence of 0.35 (95% CI 0.13–0.58), comparable with that of the general population.<sup>3</sup> Our LS population was similar to those in two previous cross-sectional studies.<sup>5,6</sup> Increased age and parity were reported in women with LS compared with other vulval conditions, as well as controls, in both of these studies,<sup>5,6</sup> one of which also reported higher BMI.<sup>5</sup> In women of comparable age and BMI to our LS population, 46% of

women aged 60–64 years<sup>7</sup> and 50% of those with BMI 25–29 kg m<sup>-2</sup> had UI.<sup>8</sup> Less frequent washing in women with LS is an interesting finding; however, discussion is beyond the scope of this letter.

The strengths of this study were the use of a validated screening tool for UI, and diagnosis by an expert clinician, with histological confirmation when required. The entire database was utilized to minimize selection bias. Data were collected from a single centre; therefore, the study population and secondary care setting may limit generalizability. A key limitation associated with the cross-sectional design is that the direction of association between UI and LS cannot be determined.

This study provides evidence of a link between UI and vulval LS. Large population-based cohort studies are now needed to determine the nature of this association.

The data that support the findings of this study and a full study report are openly available at the University of Nottingham Research Data Management Repository at <http://doi.org/10.17639/nott.7114>.

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## The additional diagnostic value of optical coherence tomography in clinically diagnosed basal cell carcinoma undergoing direct surgical excision

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DEAR EDITOR, Clinical examination appears to be very sensitive for diagnosing basal cell carcinoma (BCC) (90%), but the specificity is reported to be low (28.6–48.9%).<sup>1,2</sup> Additional use of dermoscopy can increase specificity to 54.3–55.6% compared with clinical examination alone.<sup>1,2</sup> With use of optical coherence tomography (OCT), a noninvasive diagnostic method, in addition to clinical and dermoscopic examination, it is possible to further increase the specificity to 76% at a sensitivity of 95%.<sup>1,3,4</sup> These results apply to a population of patients with a clinical suspicion of BCC who had an indication for biopsy (e.g. high-risk location or uncertainty about diagnosis). However, there are subgroups of patients, such as patients with a very high clinical suspicion for a low-risk BCC or patients with multiple BCCs, who undergo direct surgical excision without prior histopathological verification of BCC diagnosis.<sup>5,6</sup>

The aim of this study was to investigate whether OCT has additional diagnostic value in these subgroups of patients and whether it can help to reduce the risk of misclassification of non-BCC lesions as BCC. Patients were included from August 2019 to January 2021 in one academic hospital and two general hospitals in the Netherlands. The study was approved by the local ethics committee and was conducted in accordance with the Declaration of Helsinki. Written informed consent was obtained from all patients.

All included lesions were highly suspicious for BCC based on clinical and dermoscopic examination and were scheduled for surgical excision without prior histopathological

verification. Before surgery, an OCT scan was obtained for study purposes and the OCT diagnosis did not influence the treatment decision. A commercially available OCT device (< 7.5 µm lateral and < 5 µm axial optical resolution) was used for imaging (VivoSight, Michelson Diagnostics Ltd., Maidstone, UK). Analysis of OCT images was performed by one experienced observer using the morphological characteristics of BCC as previously described.<sup>7</sup> Histopathological diagnosis was used as the gold standard.

In total, 114 patients with a high clinical and dermoscopic suspicion of BCC were included; 59 (51.8%) in an academic hospital and 55 (48.2%) in general hospitals. The median age was 71 years (21–91) and 63 patients were male (55.3%). Lesions were located on the trunk (47.4%), head or neck area (35.1%) and extremities (17.5%).

The results with respect to diagnostic accuracy of OCT are summarized in Table 1. According to histopathological diagnosis, 109 of 114 lesions were BCCs, which corresponds to a positive predictive value (PPV) of 95.6% for clinical and dermoscopic diagnosis. All 109 histopathologically verified BCCs were identified as such by OCT (sensitivity 100%) and the negative predictive value in cases with a negative OCT result was 100% (four of four). In only five of 114 lesions (4.4%) histopathology revealed an alternative diagnosis, i.e. seborrhoeic keratosis, solar elastosis, benign lichenoid keratosis, warty dyskeratoma and squamous cell carcinoma (SCC). OCT identified four of these five lesions as non-BCC lesions. A benign lichenoid keratosis was misclassified as BCC by both clinical and dermoscopic examination and OCT. Furthermore, the SCC was excised with a 3-mm margin and was radically removed.

The majority (97.4%) of the lesions in this study, all scheduled for excision, were diagnosed as nodular BCCs according to clinical and dermoscopic findings. There were only three superficial BCCs, as noninvasive treatment is usually preferred in superficial BCC. Of all 109 BCCs, 11 (10.1%) were superficial, 81 (74.3%) were nodular and 17 (15.6%) were found to be infiltrative upon histopathology. Clinical and dermoscopic examination misclassified eight of 11 (72.7%) superficial BCCs as nodular, whereas with OCT seven of 11 (63.6%) were misclassified as mixed superficial/nodular BCC. In total, 17 (100%) infiltrative BCCs were misclassified as nodular by

**Table 1** Diagnostic parameters for OCT in patients with high suspicion of low-risk BCC according to clinical and dermoscopic diagnosis

	Histology		Total
	BCC	No BCC	
OCT positive for BCC	109	1	110
OCT negative for BCC	0	4	4
Total	109	5	114

BCC, basal cell carcinoma; OCT, optical coherence tomography.