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Diagnostic Pathway Delay in Penile Squamous Cell Carcinoma: a UK Regional Cohort Study

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Objective: To characterise the complete diagnostic pathway from symptom onset to treatment in penile squamous cell carcinoma (SCC) within the UK's centralised cancer network, benchmark performance against NHS waiting time standards, and identify predictors of patient delay including deprivation, obesity, and misdiagnosis.

Methods: Retrospective cohort study of 80 consecutive patients with histologically confirmed penile SCC referred to a UK regional specialist centre (catchment ~11 million) between November 2024 and February 2026. Eight sequential pathway milestones defined the delay intervals, with data extracted from electronic records onto a standardised proforma. Pre-specified imputation rules and sensitivity analyses addressed imprecise symptom-onset dates. Socioeconomic deprivation was characterised by Index of Multiple Deprivation (IMD) decile.

Results: Median total pathway delay from symptom onset to treatment was 154 days, with patient delay (median 111 days) constituting the dominant component. Forty percent waited over six months and 18% over one year. Once at secondary care, 90% met the NHS 31-day decision-to-treatment standard and 85% the 62-day standard. Fifty-nine percent presented with pT2 or above disease, 14% were node-positive, and penile-preserving surgery was performed in 65%. Misdiagnosis occurred in 29% (23/80); all 23 received active pharmacological treatment for the incorrect diagnosis, including four treated with topical corticosteroids for clinically diagnosed lichen sclerosus. Obesity was associated with substantially longer patient delay (BMI ≥30 vs <30: 160 vs 93 days; difference +57 days, 95% CI 3–112). Deprivation showed a directionally similar but imprecise association (IMD Q1–Q2 vs Q4–Q5: difference +42 days, 95% CI −19 to 94).

Conclusions: In this first UK regional cohort mapping the complete penile cancer diagnostic pathway, delay accumulated predominantly before patients reached secondary care, while the

centralised specialist pathway met NHS standards. Obesity emerged as a novel predictor of patient delay with a plausible mechanism in adult-acquired buried penis. Universal pharmacological treatment for misdiagnosis identifies primary care diagnostic uncertainty as actionable.