

Lichen Sclerosus Comorbidities and Complications from a National Sample of Patients Treated with Urethroplasty

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Abstract

Introduction: We characterize comorbidities and inpatient complications of patients with lichen sclerosus who underwent urethroplasty from a large national patient data source.

Methods: We queried the Nationwide Inpatient Sample for patients who underwent urethroplasty between 2000 and 2010. We compared demographics, comorbidities, complications, length of hospital stay and hospital charges for patients with and without the diagnosis of lichen sclerosus.

Results: An estimated 13,700 urethroplasties were performed in the United States during the study period. Patients with lichen sclerosus comprised an estimated 3.8% of the urethroplasty population. The majority of patients with urethral stricture with lichen sclerosus were Caucasian (84%) and older, with 63% age 45 or older. Chronic hypertension, diabetes mellitus, rheumatoid arthritis/collagen vascular disease and obesity were associated with increased odds of having a lichen sclerosus diagnosis. The central East Coast (7.2%) and the Pacific Northwest (6.3%) had the highest percentage of patients treated with urethroplasty with lichen sclerosus. Patients with lichen sclerosus had longer hospital stays than those without lichen sclerosus (3.5 vs 2.6 days, $p < 0.0001$). Patients with lichen sclerosus had more complications and hospital charges than those without lichen sclerosus but these differences did not reach statistical significance.

Conclusions: A higher percentage of patients with lichen sclerosus had comorbidities, increased complications and longer hospital stays compared to patients treated with urethroplasty without lichen sclerosus. Our findings demonstrate the increased complexity that providers face when treating men with lichen sclerosus related urethral stricture disease.

Key Words: lichen sclerosus et atrophicus, urethral stricture, postoperative complications, comorbidity

Abbreviations and Acronyms

LS = lichen sclerosus

NIS = Nationwide Inpatient Sample

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Urethroplasty is a cost-effective procedure used to treat male stricture disease.¹ Although uncommon, urethroplasty failure adversely impacts patient quality of life and leads to more complex repeat repairs with higher complication rates.² Urethral stricture length, prior urethroplasty failure, failed endoscopic treatments and lichen sclerosus have been associated with urethroplasty failure.³

LS is an understudied chronic immunological disorder of unknown etiology. Patients with urethral stricture with LS often require multistage repairs, and have a risk of stricture recurrence due to disease progression and often extensive involvement of the penile urethra and beyond.^{4–6} While high quality case series examining urethroplasty in patients with LS exist,^{4,6,7} the current literature is limited due to small sample sizes and specific geographical populations.

We compare demographics, comorbidities and inpatient complications after urethroplasty in patients with vs without LS from a national database representing inpatient admissions. We also explore the geographic prevalence of LS to determine if distribution patterns emerge. We hypothesize that patients with LS will have different comorbidities and higher rates of urethroplasty complications than those without a LS diagnosis.

Materials and Methods

Study Population

The Nationwide Inpatient Sample is the largest all-payer inpatient care data set designed to approximate a 20% sample of hospital admissions in the United States.¹ The NIS includes information from approximately 1,000 hospitals and 7 million hospital admissions each year.⁸

We included male patients 18 years old or older for evaluation if they had an ICD-9 code for urethral stricture and an ICD-9 procedural code for urethroplasty from 2000 to 2010. ICD-9 codes for urethral stricture include 598, 598.00, 598.01, 598.1, 598.2, 598.8 and 598.9, and ICD-9 procedural codes for urethroplasty are 58.4, 58.42, 58.44, 58.45, 58.46, 58.47 and 58.49. We grouped patients as those having ICD-9 codes for LS, 701.0, 607.81, 697.8 and 697.7, and those without a diagnosis of LS.

Predictor and Outcome Variables

From the NIS we abstracted patient age, race, comorbidities and geographic distribution of LS diagnosis. We grouped patients as having 0, 1, 2, or 3 or more NIS defined comorbidities.⁸ We evaluated the prevalence of LS diagnosis by geographic region, as defined by the Department of Health and Human Services and used previously.⁹ We

evaluated hospital bed size and the volume of urethroplasties performed yearly at each hospital (1, 2 to 9, or 10 or more). We analyzed inpatient complications, length of hospital stay and total hospital charges by LS status.

Statistics

We compared categorical outcome variables for patients with and without the diagnosis of LS using chi-square tests, and continuous outcomes with Student t-tests. We used age adjusted logistic regression to examine the association of demographics and comorbidities with the outcome of LS diagnosis. We tested for a geographic trend from east to west using a variable coded as 1 for eastern regions (1-3), 2 for Midwest regions (4-5), 3 for central regions (6-8) and 4 for western regions (9-10).⁹ Statistical analysis was performed using SAS® (version 9.2) and all analyses accommodated the complex sample survey design of the NIS. All p values less than 0.05 were considered significant.

Results

Study Population and Comorbid Risk Factors of LS

From 2000 to 2010 an estimated 13,700 inpatient urethroplasties were performed in the United States (95% CI 9,507–17,894). Of this urethroplasty population an estimated 513 patients (95% CI 201–825), or 3.8%, had LS. Patients with LS were older (years \pm SD 50.4 \pm 1.3) than those without a LS diagnosis (45.3 \pm 0.4, $p < 0.0001$). African-American patients had a lower odds of LS diagnosis than Caucasian patients (OR 0.28, 95% CI 0.10–0.78, table 1).

Patients treated with urethroplasty with a diagnosis of LS had a higher prevalence of all studied comorbid diseases (table 2). After adjusting for age, chronic hypertension, diabetes without chronic complications, rheumatoid arthritis/collagen vascular disease and obesity, all increased the odds of having a LS diagnosis. Patients with LS were more likely to have 1, 2, or 3 or more comorbidities

Table 1. Multivariable analysis of patient demographics as risk factors for LS

	% Pts with LS (513)	% Pts without LS (13,187)	OR (95% CI)	p Value
Age:				
18–45	37.0	50.0	1.00 (ref)	
46–65	47.9	36.7	1.76 (1.12–2.74)	0.013
Greater than 65	15.2	13.5	1.51 (0.85–2.68)	0.16
Race:				
Caucasian	84.3	69.7	1.00 (ref)	
African-American	5.1	15.0	0.28 (0.10–0.78)	0.015
Other	10.6	15.2	0.57 (0.27–1.24)	0.15

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