

Local Anaesthetic Day-Case Transurethral Laser Ablation of Bladder Cancer

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Background

Transurethral Laser Ablation (TULA) acts as a method to precisely apply energy to a targeted anatomical site [Figure 1]. Laser applied to tissue results in a localised increase in temperature, the energy of which can be controlled to ablate, vaporize, and tear. Further the depth of penetration of the laser can be selected when choosing which wavelength of light is applied. For these reasons laser ablation offers a robust and widely applicable procedure in Urological surgery that has growing use as a day-case procedure (1-3).

Bladder cancer remains one of the most prevalent cancers in the UK, with over 10,000 new cases diagnosed annually (4). The gold standard approach in the diagnosis and management of non-muscle invasive bladder cancers is Transurethral resection of the Bladder tumours (TURBT). Whilst an effective and safe procedure, there are high risks of low-grade complications post-operatively using the Clavien-Dindo classification (5,6). Furthermore, whilst TURBT can be performed as a day case procedure, as few as 17.9% of procedures were performed as a day case in England between 2017-2018 in the Getting it Right First Time (GIRFT) programme (7).

When comparing TURBT and TULA, studies have shown no significant changes in procedure length, however TULA may be superior to TURBT in reduced complication rates, hospitalisation time, and recurrence rates at 24 months (8,9). Through the use of 980nm and 1470nm wavelength diode systems, tumours can be removed en bloc and examined through traditional histopathological techniques. Incision, dissection, and coagulation all are performed with these two instruments, and in cases of minor/no bleeding, bladder irrigation is not required.

Despite encouraging evidence that TULA has a promising role to play within urological day-case procedures with equal outcomes to traditional TURBT, and improved complication rates, NICE guidelines acknowledge that evidence is lacking in quality and quantity, and as such further research is required.

Introduction

Transurethral Laser Ablation (TULA) can be performed under local anaesthesia as a day-case in an outpatient setting, reducing the requirement for General Anaesthetic (GA) cystoscopies/biopsies and treatment of small bladder lesions, often in elderly and co-morbid patients. We reviewed our initial clinical experience of TULA, following GIRFT recommendations to NHS Wales, to assess patient tolerability and safety.

This early study captures a small number of patients over the course of a 7-month period in Wrexham Maelor Hospital, under the Urology team.

The key implementation issues experienced included difficulties in collaborative working between clinicians and operational management in business planning, expeditiously identifying/securing funds for equipment, and satisfying all required governance procedures in Betsi Cadwaladr University Health Board (BCUHB).

Methods

The first consecutive 37 patients referred for TULA at our institution over a seven-month period (Sep 2023 – March 2024) were included. Patient demographics were reviewed. Primary outcome measure was patient tolerability using Likert scale pain scores (0-10), and patient reported procedural experience. Secondary outcomes included procedure length (laser time), ASA grade, co-morbidity status and complications.

Reported Pain and Bleeding Rates

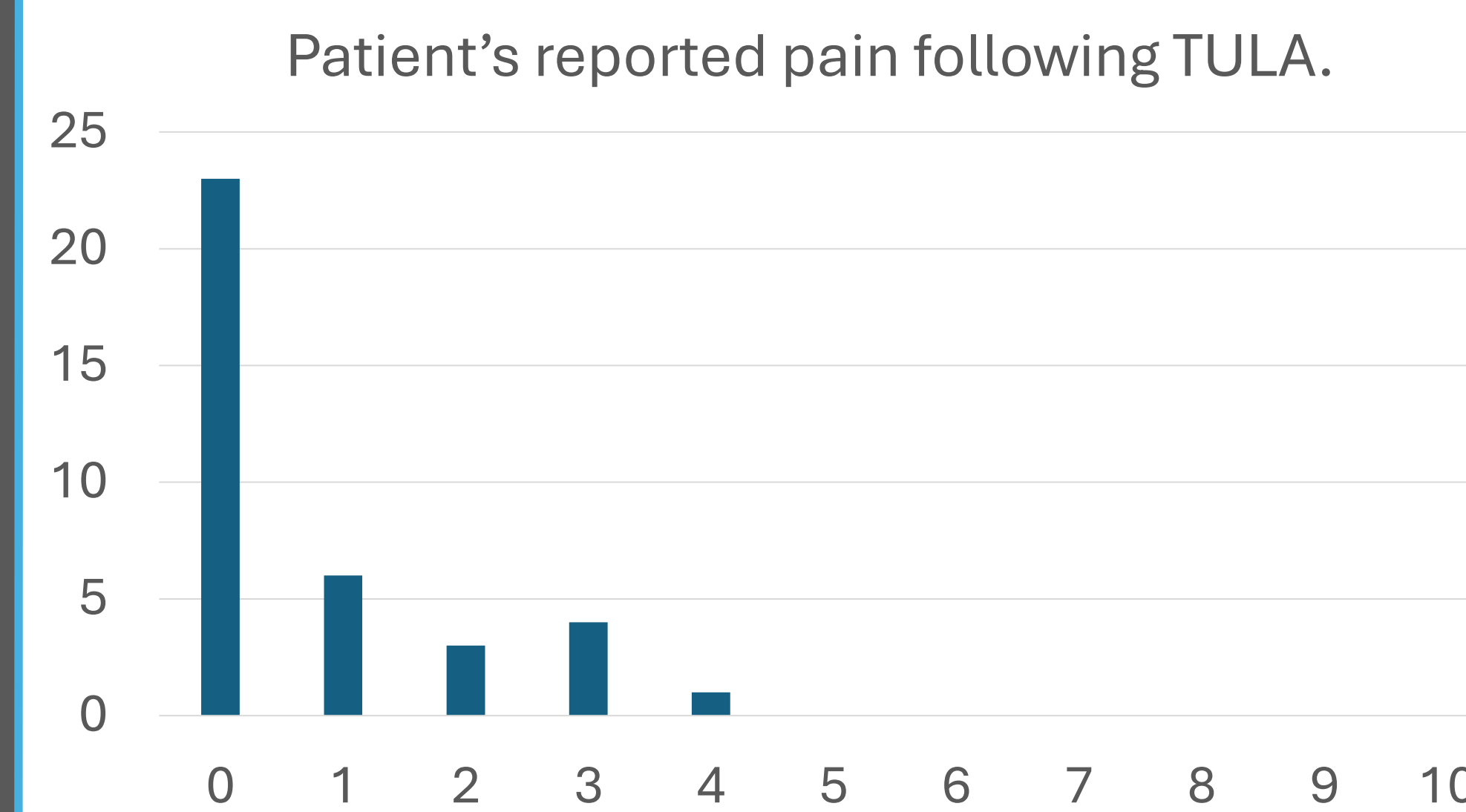


Figure 2. A bar chart showing patient's reported pain following TULA, using the Likert scale. 25 patients reporting pain score of 1.

Active Laser Time

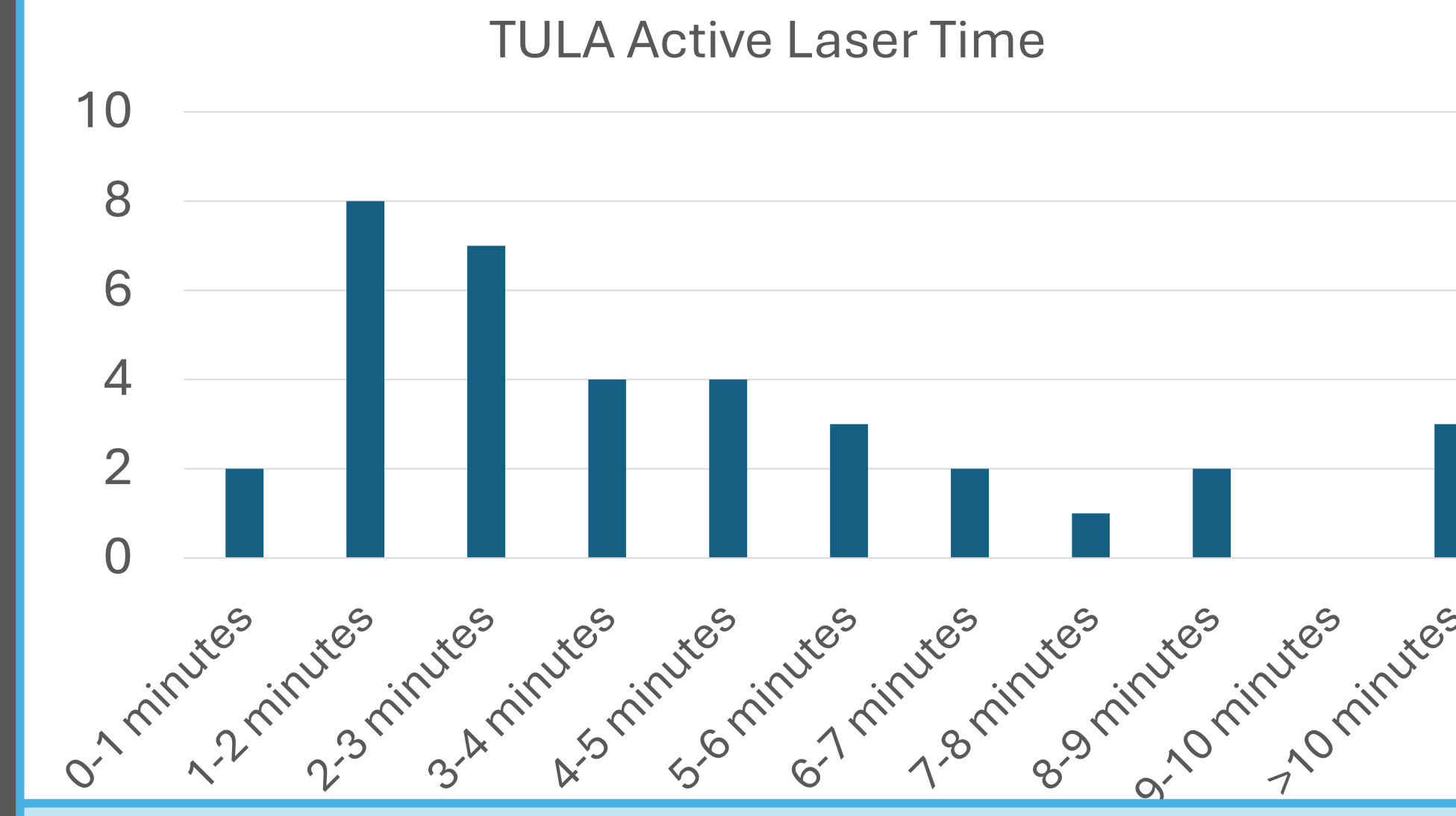


Figure 2. A bar chart showing the length of time the laser was active during the TULA procedure in ranges of minutes.

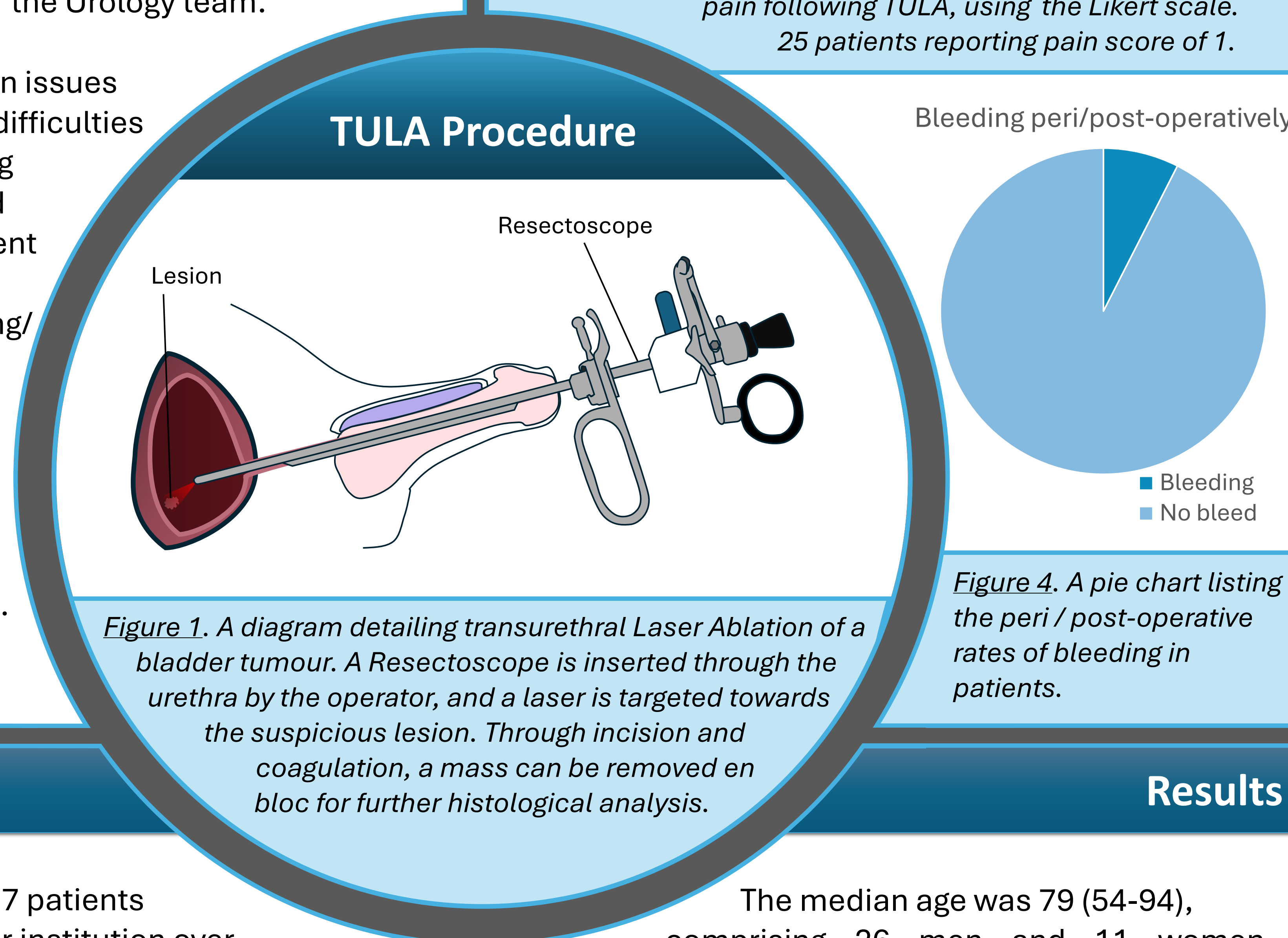


Figure 1. A diagram detailing transurethral Laser Ablation of a bladder tumour. A Resectoscope is inserted through the urethra by the operator, and a laser is targeted towards the suspicious lesion. Through incision and coagulation, a mass can be removed en bloc for further histological analysis.

Figure 4. A pie chart listing the peri / post-operative rates of bleeding in patients.

Results

The median age was 79 (54-94), comprising 26 men and 11 women. Median pain score was 0 (0-4) [Figure 1], with all 37 patients reporting highly positive subjective feedback, with main feedback being that patients were delighted they avoided the need for GA. Median laser time was 262 seconds [Figure 3] (5-867). Median ASA grade was III (II-III). 3 patients experienced bleeding [Figure 3], and no other complications occurred peri- or post-operatively.

Discussion

TULA was well tolerated, in this relatively high-risk patient population, and the subjective patient experience was very encouraging. This local anaesthetic procedure can be performed relatively quickly and safely. 62% of patients reported no pain, with 68% of all procedures completing TULA in fewer than 5 minutes.

By analysing our experience in the implementation of TULA within BCUHB, it is anticipated that further rollout of day-case TULA across NHS Wales should be a streamlined process, with a low likelihood of admission, low pain scores, and high patient satisfaction.

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