ABSTRACT The prostatic urethral lift (Urolift®) is a new and increasingly popular minimally invasive treatment for benign prostatic hyperplasia which is being offered instead of ablative or cavitating therapy. The procedure serves to pin aside the prostatic lobes to improve lower urinary tract symptoms. In this patient with a history of extensive implants, MRI was requested as part of his evaluation for a raised PSA. It became clear that the Urolift implant created a signal void which made it difficult to assess the entirety of the prostate gland radiologically. Patients who have had the procedure done and in whom an MRI is being sought should be counselled on the potential limitations and radiologists should be made aware of the implants.

KEYWORDS Prostatic urethral lift, Urolift, MRI, signal void

Background
Multiparametric MRI scanning is taking on a more significant role in prostate cancer diagnostics. It is now part of the routine diagnostic algorithm in many institutions as it has been shown to outperform traditional transrectal biopsy and improve the detection of clinically significant cancers [1]. At the same time, the prostatic urethral lift has also gained traction in the management of benign prostatic hyperplasia. The procedure serves to pin aside the prostatic lobes to improve lower urinary tract symptoms. These pins are designed with a combination of a stainless-steel tab and nitinol memory alloy tab linked together by a nonabsorbable suture. They are inserted through the prostate to hold the tissue clear of the urethra. Intermediate-term data have supported the safety and efficacy of the procedure which can be performed under local anaesthesia and is associated with substantially more tolerable side effect profile when compared to other more invasive options [2],[3],[4]. It is therefore probably inevitable that their paths would intersect.

The manufacturers of Urolift® indicate that the device is MRI compatible but acknowledge that the Urolift Urethral Endplate does create an imaging artefact 10-15mm from the device. While other authors have also acknowledged this, [2], the practical implications in actual patients have not, to the best of our knowledge, been previously described.

Case Report
A 79-year-old gentleman, in excellent health for his age, presented with a history of lower urinary tract symptoms for several years. He complained of four to five episodes of nocturia and poor flow which was affecting his sleep. His International Prostate Symptoms Score was 9 with a Quality of Life score of 4 and medical treatment with tamsulosin and finasteride had been ineffective at managing his symptoms. Two years earlier he had undergone prostatic urethral lift and during the procedure, five implants being inserted.

On examination, his abdomen was soft and non-tender with no palpable masses. Digital rectal examination revealed a moderately enlarged prostate with a cT2 prostatic nodule on the right lobe. His prostate specific antigen was tested and found
to be 3.3 ng/ml which, when adjusted for the finasteride treatment, rose to 6.6 ng/ml. Given the suspicious nodule associated with an elevated PSA, he was sent for a prostatic MRI. MRI revealed a 94-cc prostate with several signal voids in the central zone, precluding full assessment (Figs. 1 and 2). The largest of these artefacts measured 2.5 ×0.6cm on T2 weighted imaging. On diffusion-weighted imaging, the artefacts were much more apparent with the largest measuring 3.9cm ×2.5cm, and these obscured most of the prostate at this level. Identification of the nature of the signal voids challenged our radiologist until these were identified as PUL implants.

Nonetheless, an area classified as PIRADS-3 was identified centrally. Following discussion with the patient, he opted for a repeat MRI instead of biopsy. He has declined further invasive procedures, choosing instead for prostatic artery embolisation.

Discussion
The manufacturers of the device acknowledge the occurrence of the artefact and that it is magnified, as it was in our case, on diffusion-weighted imaging. Artefact-reducing MRI protocols are in the preliminary stages of development (personal communication).

It is clear that the signal void created by the device would take on greater significance in smaller glands, i.e. when the signal size to gland volume ratio is higher. It is also clear that these signal voids would be located in the central gland on imaging, leading one to question the implications of these findings given that most cancers are found in the peripheral gland. However, up to 30% of cancers have been noted in the central zone [5], and so it is imperative that this zone is thoroughly assessed.

Our patient was older, had a large gland, a mildly elevated PSA and a PIRADS-3 lesion - all factors which contributed to his decision to forgo biopsy. However, we appreciate that a diagnostic dilemma may ensue in a patient with different characteristics, i.e. smaller gland, younger age and a higher PSA. One suggested strategy is to fusion biopsy the artefact zone, i.e. to treat it as a lesion. This has significant practical implications for both physician and patient.

Conclusion
We remind readers that a history of prostatic urethral lift should be actively sought at the initial visit and relayed to the reporting radiologist. Until artefact reducing protocols are described, patients who are undergoing PUL, and particularly those at high risk of prostate cancer in the future and younger patients, or those who have undergone PUL should be counselled on the potential limitation of MRI in this population, albeit however small.

Conflict of interest
None

Informed consent
It was obtained from the patient before the publication of this case report.

References
1. Ahmed HU, El-Shater Bosaily A, Brown LC, Gabe R, Kaplan R, Parmar MK, et al. Diagnostic accuracy of multi-parametric MRI and TRUS biopsy in prostate cancer (PROMIS): a paired validating confirmatory study. Lancet. 2017;

2. Roehrborn CG. Prostatic Urethral Lift: A Unique Minimally Invasive Surgical Treatment of Male Lower Urinary Tract Symptoms Secondary to Benign Prostatic Hyperplasia. Urologic Clinics of North America. 2016.

3. Roehrborn CG, Barkin J, Gange SN, Shore ND, Giddens JL, Bolton DM, et al. Five-year results of the prospective randomized controlled prostatic urethral L.I.F.T. study. Can J Urol. 2017;

4. Sønksen J, Barber NJ, Speakman MJ, Berges R, Wetterauer U, Greene D, et al. Prospective, randomized, multinational study of prostatic urethral lift versus transurethral resection
of the prostate: 12-month results from the BPH6 study. Eur Urol. 2015;

5. Vargas HA, Akin O, Franiel T, Goldman DA, Udo K, Touijer KA, et al. Normal Central Zone of the Prostate and Central Zone Involvement by Prostate Cancer: Clinical and MR Imaging Implications. Radiology. 2012;