

ORIGINAL ARTICLE

Magnetic resonance imaging compared to ultrasound as the preferred method for diagnosing intractable haemospermia

Hu Han  | Hong-en Lei | Xiao-dong Zhang | Long Tian

Department of Urology, Institute of Urology, Capital Medical University, Beijing Chao-Yang Hospital, Capital Medical University, Beijing, China

Correspondence

Long Tian, Department of Urology, Beijing Chao-Yang Hospital, Capital Medical University, Gong Ti Nan Lu 8, Chaoyang District, 100020 Beijing, China.
Email: longtian@ccmu.edu.cn;
tianlongcyyy@163.com

Abstract

We aimed to evaluate and compare the clinical diagnostic values of magnetic resonance imaging (MRI) and ultrasound in patients with intractable haemospermia. We performed a retrospective review of 23 patients with intractable haemospermia who were diagnosed with seminal vesicle haematocele and/or calculi by transurethral seminal vesiculoscopy (TSV). Patients' demographics, disease durations, operative times, and MRI and transrectal ultrasound (TRUS) results were recorded. McNemar's test was used to compare the positive diagnostic rates of MRI and TRUS. All patients had undergone preoperative seminal vesicle MRI and TRUS to identify the aetiology of the haemospermia. The average age and disease duration were 39.3 years and 24.1 months, respectively. The mean operative time was 81.1 min. The positive result rates for MRI and TRUS were 95.7% (22/23) and 39.1% (9/23), respectively. Compared with TRUS, MRI had a significantly higher preoperative positive diagnostic rate ($p < 0.01$). These results suggest that MRI should be considered as a method for diagnosing intractable haemospermia in patients when TRUS findings are negative or inconclusive.

KEYWORDS

haemospermia, MRI, transurethral seminal vesiculoscopy, ultrasound

1 | INTRODUCTION

Patients with haemospermia are often encountered in urology and andrology clinics. Seminal vesiculitis and prostatitis are the most common aetiologies of haemospermia. Further, a small number of patients may have intractable haemospermia. Transrectal ultrasound (TRUS) is the primary investigation for diagnosing haemospermia (Christodoulidou et al., 2017). However, ultrasonography findings are often negative, which limits the ability of ultrasound to diagnose seminal vesicle diseases.

Magnetic resonance imaging (MRI) has a good diagnostic specificity for bleeding signals. It seems to play an increasingly important role, especially when surgery or TRUS is inconclusive or negative (Christodoulidou et al., 2017; Expert Panel on Urologic Imaging et al., 2017).

There is little information on the identification of the aetiology of intractable haemospermia through ultrasound and MRI. Therefore, we present a large case series of patients with intractable haemospermia who underwent preoperative MRI and ultrasound. The purpose of our study was to evaluate and compare the clinical diagnostic values of MRI and ultrasound in patients with intractable haemospermia.

2 | MATERIALS AND METHODS

2.1 | Patients and methods

In this retrospective study, we collected the data of 33 patients with intractable haemospermia who were admitted to our centre and

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2021 The Authors. *Andrologia* published by Wiley-VCH GmbH

who underwent transurethral seminal vesiculoscopy (TSV) between June 2014 and January 2020. Intractable haemospermia is defined as persistent or recurrent haemospermia that does not respond to antibiotics and conservative treatment. All patients were admitted for a detailed history regarding the colour of haemospermia, relationship between blood and semen, course of the disease, accompaniment with painful ejaculation, effectiveness of antibiotic treatment, intake of anticoagulant drugs, history of blood disorders, presence of sexually transmitted diseases, and history of surgery and trauma. The peripheral blood samples of patients were tested for routine blood parameters, coagulation function, biochemistry, AIDS, syphilis, hepatitis B and hepatitis C. Urinalysis was performed on the collected urine specimens. Physical examination was mainly focused on checking whether there was any abnormal development of the external genitalia and whether the patients had urethral haemangiomas; digital rectal examination of the prostate was performed during the physical examination. All patients had undergone preoperative seminal vesicle MRI (without intravenous contrast) and TRUS to identify the aetiology of haemospermia. Auxiliary preoperative examination data were analysed retrospectively. Patients aged over 40 years underwent routine prostate-specific antigen (PSA) tests to exclude prostate cancer.

Patients with the following criteria were included in the study: (1) patients with haemospermia in whom conservative treatment was ineffective; (2) patients who successfully underwent TSV; and (3) patients who underwent both MRI and TRUS preoperatively. A surgery was defined as successful when the access to bilateral seminal vesicles with the aid of seminal vesiculoscopy was successful.

Patients with the following criteria were excluded from the study: (a) patients with haemospermia in whom conservative treatment was effective; (b) patients with intractable haemospermia are reluctant to undergo TSV; (c) patients who underwent either ultrasound or MRI, not both, preoperatively; And (d) patients who underwent transabdominal ultrasound preoperatively.

Ultimately, 23 patients who underwent both MRI and TRUS were included in this study. Of the 10 patients who were excluded, six had undergone transabdominal ultrasound and 3 and 1 had not undergone MRI or ultrasound examinations, respectively. The study was performed in accordance with the principles of the Declaration of Helsinki, and all participants had signed informed consent forms.

At present, the following three approaches are used for TSV in clinical practice: first, a natural approach through the orifice of the ejaculatory duct; second, an approach through a pathological opening or fenestration on the posterolateral wall of the prostatic utricle; and third, transurethral resection of ejaculatory ducts. The second method to enter the seminal vesicle is preferred in our centre. The aetiology of intractable haemospermia can be confirmed intraoperatively by the operator by determining which side seminal vesicle has blood accumulation and checking for the presence of stones in the seminal vesicle.

Patients' demographics, disease durations, operative times, surgical outcomes, lengths of hospital stay, and MRI and ultrasound results were recorded. No recurrence was defined as the

disappearance of the patient's haemospermia during the follow-up observation period. Positive results from the ultrasound and MRI reports were recorded. Positive MRI findings included intraejaculatory haematocele; seminal vesicle haematoceles; special protein; and seminal vesiculitis. Positive TRUS findings included solid cystic mass in the seminal vesicle; hypoechoic seminal vesicle; and seminal vesicle with a strong echo, high echo, or no echo. The aetiologies of intractable haemospermia were confirmed by TSV and divided into the seminal vesicle haematocele and calculi (SVHC) and seminal vesicle haematocele (SVH) groups postoperatively. Patients' clinical characteristics were compared according to the aetiology.

2.2 | Statistical analysis

Dates and results are presented as mean \pm standard deviation. All statistical analyses were performed using the statistical software package SPSS version 18.0 (SPSS Inc., IBM, Chicago, IL, USA). McNemar's test was used to compare the positive diagnostic rates of MRI and TRUS. Student's *t*-test was performed to compare the clinical characteristics between the SVHC and SVH groups. A *p*-value of <0.05 was considered statistically significant.

3 | RESULTS

Preoperative coagulation function was checked to rule out haemospermia due to coagulation abnormalities, and all patients denied a history of external genital trauma and surgery. Urinalysis results suggested no evidence of urinary tract infection. Genital malignancies such as prostate and testicular cancer that may have caused haemospermia were ruled out in all the patients after MRI, ultrasound, physical examinations, and PSA testing. Three patients had a history of long-term oral anticoagulation, but at the same time, their MRI findings revealed haematoma in the seminal vesicles, requiring the use of TSV; hence, they were included in this study. The MRI findings of four patients suggested associated ejaculatory duct cysts and those of five patients suggested prostatic utricle cysts. All patients were successfully treated with TSV, and SVHC and SVHs were confirmed in 82.6% (19/23) and 17.4% (4/23) patients, respectively.

The average age and disease duration were 39.3 years and 24.1 months, respectively. The mean operative time was 81.1 min. The proportion of positive results for MRI and TRUS was 95.7% (22/23) and 39.1% (9/23), respectively. Table 1 summarizes the clinical characteristics of the patients. Compared with ultrasound, MRI had a significantly higher preoperative positive diagnostic rate ($p < 0.01$; Table 2). In one of the patients, haemospermia reappeared 1 month after surgery, and 1 week of oral anti-inflammatory drug treatment and regular ejaculation was recommended haemospermia disappeared completely. No complications such as urinary incontinence, urethral stricture, urinary tract infection, ejaculation pain, orchitis or epididymitis were observed during the postoperative follow-up for an average of 25.4 months.

Seminal vesicle haematoceles or/and calculi were confirmed in all 23 patients by TSV. For example, a patient was diagnosed SVHC; however, TRUS showed no obvious abnormalities preoperatively (Figure 1a). Preoperative MRI showed a haematocele in the left seminal vesicle (Figure 1b and c). A haematocele with prostatic utricle calculi (Figure 1d). After the operation, SVHC could be seen through TSV (Figure 1e).

Preoperative MRI report revealed positive findings in 22 patients including in 1 with intraejaculatory haematocele; 4, 11, and 3 with

left, right, and bilateral SVH, respectively; 1 with special protein; and 2 with seminal vesiculitis. One patient showed no abnormalities on preoperative MRI, but a haematocele in the left seminal vesicle was confirmed by intraoperative TSV.

In the preoperative ultrasound report, only nine patients had abnormal findings, including two with a solid cystic mass in the seminal vesicle; one with a strong echo in the seminal vesicle with ejaculatory duct dilatation; two with hypoechoic seminal vesicles; and 1, 2 and 1 with a strong, high and no echo in the seminal vesicle, respectively.

Left and right seminal vesicle haematoceles were confirmed by TSV during the operation in 8 and 15 cases, respectively. Compared to MRI, TSV was advantageous as it allowed accurate determination of the side of the seminal vesicle with the haematocele.

Data on the patients' clinical characteristics are provided in Table 3. There were no significant differences between the SVHC and SVH groups with regard to the patients' age, (37.7 ± 15.0 versus 47.3 ± 15.0 years, $p = 0.258$), disease duration (26.0 ± 25.2 versus 15.5 ± 10.6 months, $p = 0.432$), lengths of hospital stay, (6.2 ± 1.4 versus 7.5 ± 2.1 days, $p = 0.127$), operative times (82.6 ± 27.9 versus 73.8 ± 32.8 min, $p = 0.579$) and body mass indices (26.3 ± 3.7 versus 23.8 ± 3.9 kg/m², $p = 0.241$).

TABLE 1 Clinical characteristics of the patients with intractable haematospermia

Variable	n = 23
Age(y), mean \pm SD	39.3 \pm 15.1
Disease duration(m), mean \pm SD	24.1 \pm 23.5
Hospitalization day(d), mean \pm SD	6.4 \pm 1.6
Operative time(min), mean \pm SD	81.1 \pm 28.2
BMI (kg/m ²), mean \pm SD	25.9 \pm 0.8
Follow-up period (m),mean \pm SD	25.4 \pm 3.5
The aetiology of haematospermia, %(n)	
Seminal vesicle haematocele and calculi	82.6 (19/23)
Seminal vesicle haematocele	17.4 (4/23)
Positive rate of ultrasound and MRI, %(n)	
Ultrasound	39.1 (9/23)
MRI	95.7 (22/23)

Abbreviation: BMI, body mass index.

TABLE 2 Comparison of TRUS and MRI in patients with intractable haematospermia

MRI	TRUS		Total
	Positive	Negative	
Positive	9	13	22
Negative	0	1	1
Total	9	14	23

Note: $p < 0.01$ according to the Mc Nemar tests.

Abbreviations: MRI, magnetic resonance imaging; TRUS, transrectal ultrasound.

4 | DISCUSSION

The prevalence of haematospermia among urology patients is 0.21% (342/161258), and intractable haematospermia only accounted for 0.022% (36/161258) (Efesoy et al., 2020). Due to its rarity, clinicians are often confused about the approach to manage haematospermia. Our study summarized the data of 23 patients with intractable haematospermia that were collected over 5 years. All patients successfully underwent TSVs. Based on the TSV results, a retrospective analysis of the diagnostic values of preoperative MRI and TRUS revealed that the positive diagnostic rate was 95.7% (22/23) with MRI and only 39.1% (9/23) with TRUS. The preliminary results showed that MRI has more clinical significance in diagnosing intractable haematospermia. Furthermore, some genital malignancies such as prostate and testicular cancers and seminal vesicle tumours that might cause haematospermia can be ruled out with the help of MRI.



FIGURE 1 Magnetic resonance imaging and transrectal ultrasound (TRUS) findings in patients with intractable haematospermia. (a) TRUS showing no obvious abnormalities preoperatively. (b and c) High-intensity signals on T1WI and middle-intensity signals in the left seminal vesicle (red arrow) on T2WI. (d) High- and low-intensity signals at the punctate area (red arrow) in the prostatic utricle cyst on T1WI. (e) Seminal vesicle fluid, prostatic utricle calculi, and old haemorrhages from the left seminal vesicle can be seen in the left, middle, and right injection syringes, respectively, after TSV. T1WI, T1-weighted images; T2WI, T2-weighted images; TSV, transurethral seminal vesiculoscopy

TABLE 3 Comparison of clinical characters between seminal vesicle haematocele and calculi (SVHC) and seminal vesicle haematocele (SVH) groups

Variable	SVHC(n = 19)	SVH(n = 4)	p Value
Ages (y)	37.7 ± 15.0	47.3 ± 15.0	0.258*
Disease duration (m)	26.0 ± 25.2	15.5 ± 10.6	0.432*
Hospitalization stay (d)	6.2 ± 1.4	7.5 ± 2.1	0.127*
Operative time (min)	82.6 ± 27.9	73.8 ± 32.8	0.579*
BMI (kg/m ²)	26.3 ± 3.7	23.8 ± 3.9	0.241*

Abbreviations: SVH, seminal vesicle haematocele; SVHC, seminal vesicle haematocele and calculi.

*Student's *t*-test.

Further investigations are needed if haematospermia persists or recurs after empirical antibiotics treatment. TRUS and MRI can be used as the main modalities for further examination. If ultrasound is not significantly positive and haematospermia persists, it is important to recommend MRI to investigate the presence of hematoma in the seminal vesicles or to rule out congenital anatomical abnormalities.

For patients with intractable haematospermia, an increasing number of studies have suggested that TSV is a safe and effective method of diagnosis and treatment that can both significantly alleviate haematospermia and treat seminal vesicle calculi (Chen et al., 2018; Liao et al., 2019; Miao et al., 2020; Song et al., 2020; Tian et al., 2018; Zaidi et al., 2019). However, whether all patients with intractable haematospermia need to undergo TSV can be investigated by actively using MRI or ultrasound to evaluate the aetiology of the haematospermia before surgery. Some retrospective studies demonstrated that TRUS is the imaging procedure of choice for patients with haematospermia (Expert Panel on Urologic Imaging et al., 2017; Furuya et al., 1999; Worischek & Parra, 1994). It can identify structural abnormalities of the prostate gland and seminal vesicles.

However, our study found that the positive detection rate of preoperative TRUS was relatively small, only accounting for 39.1%, and that most cases only reported changes in the echo of the seminal vesicles with no abnormal structures. Only two patients had cystic solid masses in the seminal vesicle; however, a haematocele accompanied by a blood clot was confirmed in the seminal vesicles on TSV, and the patients' clinical courses lasted more than 3 years. Therefore, we re-evaluated the clinical diagnostic value of ultrasound for intractable haematospermia. Our retrospective study showed that the presence of bleeding signals in the seminal vesicles and the presence of stone shadows could be diagnosed by MRI before surgery. MRI had a positive diagnostic rate of 95.7%, which was significantly higher than that of TRUS. Li et al., (2013) found that 86.3% of patients with intractable haematospermia showed typical and characteristic changes in the ejaculatory duct area on MRI, including signal intensity changes in 60 (58.8%), seminal vesicle volume changes in

32(31.4%), and formation of cysts such as prostatic utricle cysts in 27 (26.5%), Mullerian cysts in 4 (3.9%), ejaculatory duct cysts in 5 (4.9%), and a seminal vesicle cyst in 1(1.0%); some patients showed more than one change.

MRI and TRUS have specific characteristics and may play different roles in the management of patients with haematospermia. TRUS, with its low cost and simplicity, can be used as an initial screening tool to observe any echogenic changes in the seminal vesicle gland, changes in the size of the seminal vesicles, and anatomical abnormalities in the prostate gland. If the results are negative or inconclusive and the haematospermia persists without improvement after antibiotics and conservative treatment, MRI should be considered as a further adjunctive diagnostic tool to determine the presence of haematocele and stones in the seminal vesicle and the need for TSV.

A preoperative MRI has significant diagnostic value. If a haematocele or stones are confirmed in the seminal vesicles on preoperative MRI, the information can be used as an absolute indication for TSV. If not, the decision to perform TSV should be made with caution, and the patient's basic clinical characteristics should be reassessed to judge whether the haematospermia has another aetiology, such as posterior urethral haemangioma; ejaculatory duct obstruction; urogenital malignant disorders including prostate, testicular, and seminal vesicle cancers; urogenital malformations; and bleeding disorders. (Efesoy et al., 2020; Fuse et al., 2011; Han et al., 2015; Mittal et al., 2016; Ren et al., 2020; Tian et al., 2018).

In a normal population, seminal vesicle MRI shows low-intensity signals on T1-weighted images (T1WI) and high-intensity signals on T2-weighted images (T2WI). Patients with intractable haematospermia showed high-intensity signals on T1WI and low-intensity, or middle- and high-intensity signals on T2WI, which indicated the presence of fresh or old haemorrhages in the seminal vesicles (Figure 1b and c). These findings were consistent with those of previous reports (Li et al., 2012; Li et al., 2013; Liao et al., 2019; Song et al., 2020). The condition can be used as an absolute indication for TSV. If scattered low-intensity signals are present on both T1WI and T2WI preoperatively, the holmium laser and lithotripsy basket need to be prepared preoperatively, considering the possibility of seminal vesicle calculi. In our study, seminal vesical and prostatic utricle calculi (Figure 1d) showed low-intensity signals both on T1WI and T2WI preoperatively, and the conditions were confirmed on TSV. As the opening of the ejaculatory duct is very small, a haematocele in the seminal vesicles will form blood clots, which are difficult to discharge by the natural ejaculation process. During TSV, the haematocele in the seminal vesicles can be flushed out with saline under direct vision to ensure that the discharged semen is free of blood contamination and to achieve resolution of the haematospermia.

The preoperative diagnostic rate of the seminal vesicle haemorrhage location was slightly lower with MRI than with TSV. Preoperative MRI showed 4, 11, and 3 cases of left, right, and bilateral seminal vesicle haemorrhages, respectively, whereas TSV confirmed 8 and 15 cases of left and right seminal vesicle haemorrhages, respectively. Bilateral seminal vesicle haemorrhages were not seen on TSV. The special proteins and seminal vesiculitis reported on

preoperative MRI findings were actually seminal vesicle haemorrhages. As haemorrhage and special proteins are difficult to distinguish by MRI signals, they can only be confirmed by TSV. Because the patients mainly complained of haematospermia, we suggest that radiologists should consider seminal vesicle haemorrhage in the preoperative MRI report.

The pathophysiological mechanism of haematocele and stone formation in the seminal vesicles deserves further study. We speculate that the narrowing of the ejaculatory duct opening, due to some reasons such as congenital anatomical abnormalities of ejaculatory duct cysts, prostatic utricle cysts, Müllerian duct cysts and inflammation, causes poor flow of the seminal fluid. During ejaculation, the pressure in the seminal vesicle gland rises suddenly and the small submucosal blood vessels rupture and bleed, causing blood to accumulate in the seminal vesicle. Due to narrowing of the ejaculatory ducts opening, the accumulated blood is not discharged smoothly, gets deposited and forms stones over time.

Our study had certain limitations. First, this was a retrospective study; it was difficult to perform a prospective controlled study in the clinic as the incidence rate of intractable haematospermia is relatively low. Second, a small number of patients underwent transabdominal ultrasound. We expect that TRUS will be used in subsequent studies to reduce deviations. Third, as the doctors who performed the ultrasound and reported on the MRI were different, it was difficult to avoid deviations caused by the difference in the doctors' skill levels.

In conclusion, the findings of this report suggest that MRI should be considered as a method for diagnosing intractable haematospermia in patients when TRUS findings are negative or inconclusive.

ORCID

Hu Han  <https://orcid.org/0000-0002-3326-8615>

REFERENCES

- Chen, R., Wang, L., Sheng, X., Piao, S. G., Nian, X. W., Cheng, X., Zhou, T., Li, H. Z., Liu, Y. W., Chen, G. H., & Zhang, C. L. (2018). Transurethral seminal vesiculoscopy for recurrent hemospermia: Experience from 419 cases. *Asian Journal of Andrology*, *20*, 438–441. https://doi.org/10.4103/aja.aja_76_17
- Christodoulidou, M., Parnham, A., & Nigam, R. (2017). Diagnosis and management of symptomatic seminal vesicle calculi. *Scandinavian Journal of Urology*, *51*, 237–244. <https://doi.org/10.1080/21681805.2017.1295398>
- Efesoy, O., Çayan, S., Aşçı, R., Orhan, İ., & Yaman, Ö. (2020). Hemospermia is rarely related to genitourinary cancer: Lessons learned from 15 years of experience with 342 cases. *International Journal of Impotence Research*. <https://doi.org/10.1038/s41443-020-0330-9>
- Expert Panel on Urologic Imaging; Hosseinzadeh, K., Oto, A., Allen, B. C., Coakley, F. V., Friedman, B., Fulgham, P. F., Hartman, M. S., Heller, M. T., Porter, C., Sahni, V. A., Sudakoff, G. S., Verma, S., Wang, C. L., Yoo, D. C., Remer, E. M., & Eberhardt, S. C.. (2017). ACR appropriateness criteria hemospermia. *American College of Radiology*, *14*, S154–S159. <https://doi.org/10.1016/j.jacr.2017.02.023>
- Furuya, S., Ogura, H., Saitoh, N., Tsukamoto, T., Kumamoto, Y., & Tanaka, Y. (1999). Hemospermia: An investigation of the bleeding site and

- underlying lesions. *International Journal of Urology*, *6*, 539–548; discussion 548. <https://doi.org/10.1046/j.1442-2042.1999.611110.x>
- Fuse, H., Komiya, A., Nozaki, T., & Watanabe, A. (2011). Hemospermia: Etiology, diagnosis, and treatment. *Reproductive Medicine and Biology*, *10*, 153–159. <https://doi.org/10.1007/s12522-011-0087-4>
- Han, H., Zhou, X. G., Fan, D. D., Tian, L., & Zhang, X. D. (2015). An unusual etiology for hemospermia and treatments that were successful. *Urology*, *86*, 740–743. <https://doi.org/10.1016/j.urology.2015.06.031>
- Li, B.-J., Zhang, C., Li, K., Zhang, J., Zhang, Y., Sun, Z.-Y., Kang, H.-Y., Zhou, B., Jin, F.-S., Zhang, K.-Q., & Li, Y.-F. (2013). Clinical analysis of the characterization of magnetic resonance imaging in 102 cases of refractory haematospermia. *Andrology*, *1*, 948–956. <https://doi.org/10.1111/j.2047-2927.2013.00132.x>
- Li, Y. F., Liang, P. H., Sun, Z. Y., Zhang, Y., Bi, G., Zhou, B., Li, K., Bai, W., Wang, L. F., Zhang, J., & Jin, F. S. (2012). Imaging diagnosis, transurethral endoscopic observation, and management of 43 cases of persistent and refractory hemospermia. *Journal of Andrology*, *33*, 906–916. <https://doi.org/10.2164/jandrol.111.015487>
- Liao, L.-G., Li, Y.-F., Zhang, Y., Li, K., Zhu, T., Li, B.-J., Wang, Q., Liu, X.-D., Luo, Y., Zhou, B., & Jiang, J. (2019). Etiology of 305 cases of refractory hemospermia and therapeutic options by emerging endoscopic technology. *Scientific Reports*, *9*, 5018. <https://doi.org/10.1038/s41598-019-41123-2>
- Miao, C., Liang, C., Wang, Y., Song, Z., Xu, A., Liu, B., Li, J., Song, N., & Wang, Z. (2020). The management and composition of symptomatic seminal vesicle calculi: Aetiological analysis and current research. *BJU International*, *125*, 314–321. <https://doi.org/10.1111/bju.14758>
- Mittal, P. K., Camacho, J. C., Sahani, D. V., Kalb, B., Harri, P. A., Master, V., Kokabi, N., Hartman, M., Kitajima, H. D., & Moreno, C. C. (2016). Hemospermia evaluation at MR imaging. *Radiographics*, *36*, 1373–1389. <https://doi.org/10.1148/rg.2016150195>
- Ren, Z. J., Yang, B., Lu, D. L., Liu, S. Z., Yang, L. C., Wang, L. C., Peng, Z. F., Liu, L. R., & Dong, Q. (2020). Transurethral resection of ejaculatory duct combined with seminal vesiculoscopy for management of persistent or recurrent hemospermia in men with ejaculatory duct obstruction. *BMC Urology*, *20*, 34. <https://doi.org/10.1186/s12894-020-00589-3>
- Song, L., Han, H., Lei, H., Cui, Y., Feng, S., Zhang, X., & Tian, L. (2020). Successful treatment of seminal vesicle calculi and prostatic utricle calculi by transurethral seminal vesiculoscopy. *Andrologia*, *52*(11), e13804. <https://doi.org/10.1111/and.13804>
- Tian, L., Han, H., Lei, H.-E., & Zhang, X.-D. (2018). Clinical features of haematospermia associated with seminal vesicle calculi versus posterior urethral haemangioma. *Andrologia*, *50*, e13072. <https://doi.org/10.1111/and.13072>
- Worischek, J. H., & Parra, R. O. (1994). Chronic hemospermia: Assessment by transrectal ultrasound. *Urology*, *43*, 515–520. [https://doi.org/10.1016/0090-4295\(94\)90243-7](https://doi.org/10.1016/0090-4295(94)90243-7)
- Zaidi, S., Gandhi, J., Seyam, O., Joshi, G., Waltzer, W. C., Smith, N. L., & Khan, S. A. (2019). Etiology, diagnosis, and management of seminal vesicle stones. *Current Urology*, *12*, 113–120. <https://doi.org/10.1159/000489429>

How to cite this article: Han H, Lei H-E, Zhang X-D, Tian L. Magnetic resonance imaging compared to ultrasound as the preferred method for diagnosing intractable haematospermia. *Andrologia*. 2021;53:e14054. <https://doi.org/10.1111/and.14054>