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A cross-sectional pilot study to investigate patient attitudes and perception regarding the use of real time digital recording of urological procedures for research and teaching purposes

Gary Sharp [a], Giorgio Mazzon [b, *], Ranjan Thilagarajah [a]

[a] Department of Urology, Broomfield Hospital, Court Road, Broomfield, Chelmsford, Essex CM1 7ET, UK
[b] University College Hospital, Endourology Unit, London, UK

HIGHLIGHTS

- We investigate the use of real time digital recording of urological procedures for research and teaching purposes.
- Male patients are most willing to consent in comparison with female patients.
- Older patients resulted to have a higher propensity in being recorded for medical teaching.
- Greater than 50% believe being recorded is intrusive but the majority do not think privacy is an issue.

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ABSTRACT

Little conclusive evidence exists regarding the best way to educate and evaluate skill acquisition of advanced surgical trainees, despite it being recognised as one of the most important aspects of training. Many laparoscopic trainers have been produced with complex engineering at great cost, but, there seems to be a reluctance to use the most precious entity available to us; the patient. We thus propose the use of real time digital recording of urological procedures for research and teaching purposes. This study was prompted by the lack of literature regarding such issues.

A 19 question questionnaire was circulated at a single urology out-patient department (Essex, England) over a 6 month period to evaluate attitudes and perceptions of urological patients on potentially having their procedure digitally recorded for educational and research purposes. 11 patients declined, 187 questionnaires were included in the final analysis.

Male patients are more willing to consent than female patients. Older patients resulted to have a higher propensity in being recorded for medical teaching. Greater than 50% believe being recorded is intrusive but the majority do not think privacy is an issue. Lastly, the vast majority require a formal debrief post operatively.

Our results show that a percentage of the public are potentially willing to be digitally recorded but many financial and social barriers exist. We have also highlighted areas of possible future research, namely the reluctance behind young urology patients to consent and questions regarding how best to educate possible study participants to ensure proper *informed* consent is gained.

1. Introduction

There is limited evidence regarding the evaluation of advanced surgical trainees' technical abilities and no principal method favoured. There is even further uncertainty surrounding advanced minimally invasive surgical (MIS) education [1]. Some even suggest teaching and assessment of skill attainment is the most inconsistent component in surgical teaching, despite being one of the most important [2]. What is known is that "deficiencies in performance are unlikely to be corrected unless there is a mechanism to provide reliable and systematic feedback" [3].

The introduction of working time directives in many developed countries and a decrease in training years has reduced operative exposure for trainees [4]. It is now more pertinent than ever to find a socially acceptable educational tool that can aid trainee surgeons in

* Corresponding author. Tel.: +44 7913 990473.
E-mail addresses: garybeau1@yahoo.co.uk (G. Sharp), giorgiomazzon83@gmail.com (G. Mazzon).

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becoming expert surgeons. Our survey aims to investigate patient attitudes and perceptions regarding the potential use of real time digital recording of urological procedures for teaching purposes.

Halsteads prophecy (1904) of "see one, do one, teach one", was the mantra of surgical education for decades. This method has now fallen out of favour and for many reasons is no longer accepted [5]. Subsequently the "learning curve" was hypothesised which assessed one's ability to develop over time against errors made [5]. The learning curve was proposed to have an inverse relationship to the number of errors made and time until an expert surgeon is established [5].

Surgeons then enlisted non-surgeons to develop teaching tools and the first computer based surgical simulator was developed in 1989 by NASA employees [5]. The use of virtual reality was then proposed and simulated laparoscopic trainers were created [5]. Initially laparoscopic techniques did not reduce morbidity, rather cases of biliary injury rose significantly in the United States [6]. This increase was due to untrained surgeons using unfamiliar instruments and techniques. Although laparoscopic simulators teach subjects how to manoeuvre the camera and manipulate objects [5] whilst allowing errors to be made without harming patients [7] they are far from the real thing and their validity has been questioned [8]. Some authors even go as far to suggest that simulators show no significant training enrichment [9].

Simulator development then recruited haptic feedback to enhance MIS training [5]. The belief was that more mistakes were being made due to a lack of haptic feedback. However, in a recent systematic review this theory has been rebuked with results showing no clear consensus regarding its importance in education [10].

Advances in technology and the evolution of a digital era have meant a greater ability to educate through a hands-off approach [11] with an emphasis to educate surgeons through the use of simulators [4]. The technology needed to create realistic images requires the combined efforts of mechanical, aerospace and nuclear engineers [12] with many authors acknowledging challenges in using such technology [11]. The cost to purchase this technology is unrealistic for many surgical training units/hospitals/medical schools. The use of real time digital recording would negate such costs. Hedican and Nakada [13] state that "teaching must occur in an environment that is safe but also cost effective and transferable to the operating room". There is an increased interest on real time digital recording as part of teaching of surgical trainees and there is evidence that watching other surgeon operate can determine an improvement of surgical outcomes [14]. We feel our proposed methods achieve all of these. However, there is scant evidence regarding the use of real time digital recording of laparoscopic procedures as a means to evaluate and educate advanced surgical trainees.

We feel that real time digital recording of urological procedures for teaching purposes will ultimately lead to a better advanced surgical training experience, greater skill acquisition and reduce the potential for surgical errors. Our principle, mirrored by other authors [1], ensures that the patient remain the sole focus and we are only suggesting trainees be recorded in procedures they are already deemed competent in. To our knowledge no previous data exist regarding patient attitudes and perceptions surrounding the use of real time digital recording of urological procedures for teaching purposes.

Through our research we hope to address four key research questions; does age influence patients willingness to consent to real time digital recording of urological procedures for research and teaching purposes? Does gender influence patients willingness to consent to real time digital recording of urological procedures for research and teaching purposes? Is real time digital recording of urological procedures for research and teaching purposes socially acceptable? What percentage of our sample necessitate a formal debrief post real time digital recording?

Table 1
Answers given by patients.

Questionnaire's question	Answer (%)
Would you be willing to have your treatment filmed for research purposes?	
No	72 (38.5)
Yes	113 (60.4)
Did not answer	2 (1.1)
Do you feel the public may think filming patients is intrusive?	
No	81 (43.3)
Yes	98 (52.3)
Did not answer	8 (4.3)
Do you feel this would affect your privacy and dignity?	
No	107 (57.2)
Yes	79 (42.2)
Did not answer	1 (0.5)
When being filmed do you feel discussing your Past Medical History (PMH) is appropriate?	
No	42 (22.5)
Yes	129 (69.0)
Did not answer	16 (8.6)
Do you feel discussing your PMH may compromise confidentiality?	
No	121 (64.7)
Yes	53 (28.3)
Did not answer	9 (4.8)
If you were potentially filmed would you want your face excluded?	
No	49 (26.2)
Yes	118 (63.1)
Did not answer	18 (9.6)
Do you feel the surgeons should be anonymised to protect patient confidentiality?	
No	102 (54.5)
Yes	69 (36.9)
Did not answer	16 (8.6)
How many staff present during potential filming?	
1	44 (23.5)
2	8 (4.3)
3	22 (11.8)
More than 3	27 (14.3)
Did not answer	86 (46.0)
Would you prefer the filming to be carried out by a same sex operator?	
No	83 (44.4)
Yes	67 (35.8)
Did not answer	37 (19.8)
If you were unconscious, would you be happy for your next of kin to agree to your treatment being filmed?	
No	57 (30.5)
Yes	102 (54.5)
Did not answer	28 (15.0)
Would you want to view footage prior to use?	
No	39 (20.9)
Yes	116 (62.0)
Did not answer	32 (17.1)
Would you like an opportunity to ask questions and be debriefed?	
No	25 (13.4)
Yes	124 (66.3)
Did not answer	38 (20.3)
Would you prefer images to be left in the recording if complications arose?	
No	49 (26.2)
Yes	87 (46.4)
Did not answer	51 (27.3)
Would you mind medical/surgical colleagues viewing the recordings?	
No	123 (65.8)
Yes	30 (16.0)
Did not answer	34 (18.2)
Would you want filming to stop if complications arose?	
No	58 (31.0)
Yes	10 (5.3)
Upset to be filmed but don't stop recording	19 (10.2)
Did not answer	100 (53.5)

2. Materials and methods

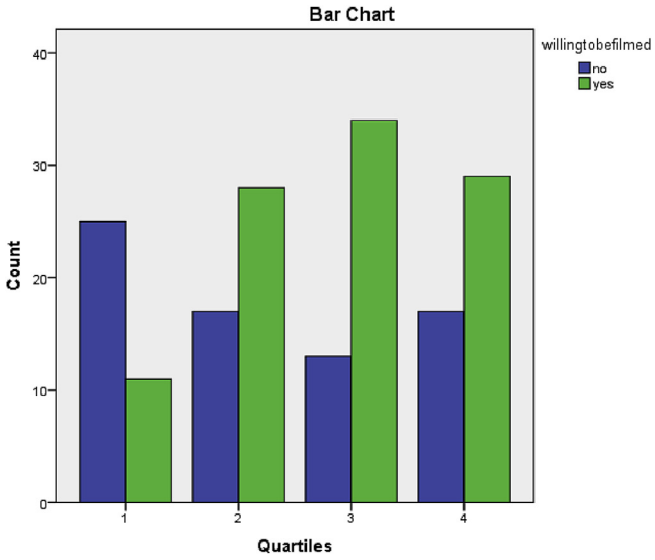
After gaining local research approval all authors studied the General Medical Council's (GMC) "Good Medical Practice Guidelines, 2013" and translated several guidelines into 46 questions. After discussion all authors agreed to include 16 questions based

Table 2
Final white space comments.

Social acceptance	"Due to the nature of this treatment I would not be happy to be filmed"
	"Requires volunteers"
Good idea	"Good idea to film"
	"If this is to help teaching, I'm all for it"
	"Filming is a great way for students to learn as they tend to remember the film rather than reading the text"
	"I would like to think this (consent to being filmed) would help with teaching"
Concerns around privacy/sensitivity	"Very concern about issues of privacy"
	"The whole procedure should be done with sensitivity"
	"I would generally support filming for research purposes as long as films did not find their way to public TV channels"
Those totally unwilling	"Personally would not be willing"
Thought provoking…	"Would it speed up treatment?"
	"Filmed if necessary for diagnosis"

on GMC guidance in the questionnaire. The 16 questions included 3 white space and 13 Yes/No questions exploring patient perspective on potentially having their urological procedure digitally recorded for research and educational purposes. Once the questions were finalised and approved they were arranged onto a single A4 sheet, at the top of which was a brief outline of the study aims. The questionnaires were distributed in one urology out-patient department in the Mid-Essex Trust, UK, by a single author (GS) over a 6 month period. Patients were approached and a brief explanation of the study and the hypothetical questions it contained given. No patients were actually recorded at any time throughout this survey. No selection or exclusion criteria were used. Eleven patients decline outright; no reason for their refusal was elicited. A total of 187 questionnaires remained, the results of which were entered onto an SPSS spreadsheet for later analysis. Statistical analysis was performed with SPSS 20.0 software. We sought if age (patients subdivided in quartiles) and sex were related to different answers in the questionnaire by univariate analysis. P values < 0.05 were considered significant.

Table 3
Willing to be filmed?



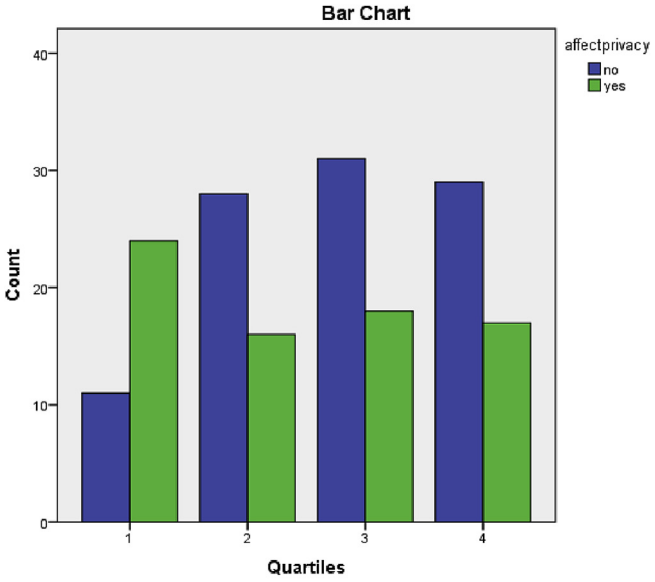
		Willing to be filmed		Sig.
		No (%)	Yes (%)	
Quartiles	1	25 (69.44)	11 (30.56)	p=0.04
	2	17 (37.77)	28 (62.23)	
	3	13 (27.65)	34 (72.35)	
	4	17 (36.95)	29 (63.05)	

3. Results

187 adults (over 18 years of age) were recruited with a median age of 66 years (IQR: 23). Age ranges were 22–91 (males) and 22–92 (females). 136 patients (73.1%) enrolled were males (median age: 68, IQR: 19) and 51 (27.3%) were female (median age: 60, IQR: 24). The answers given to the survey are presented in Table 1.

113 out of 187 patients (60.4%) would potentially consent to being recorded for teaching purposes whilst 98 patients (52.3%) considered being digitally recorded intrusive. However, the majority of participants (57.2%) thought it did not affect privacy. When participants were asked how we could minimise privacy and intrusive issues very few comments were left in the available white space (37 out of 187 questionnaires collected). Comments left fell into two broad categories; those generally opposed to the idea - "Don't do it", "don't agree with filming" - and those surrounding anonymity such as "… no mention of name or anything to identify me", "Hide identity". The majority (63.1%) wanted their face excluded from any potential images, but did not feel surgeons should also be anonymised (54.5%). Most were willing for a brief introduction regarding their relevant medical/surgical history to be narrated in order to set the scene (66.3%) with the majority not feeling this would compromise confidentiality (64.7%). The response rate was poor when asked how many medical staff should be present during potential recordings. Regardless, the general consensus was "as many as is needed". The qualitative results regarding how participants would feel if complications arose during surgery can be divided into 3 recurring themes; (1) negatively charged emotional responses "annoyed; worried; horrified; sick; scared; numb"; (2) unperturbed responses "carry on and learn from it; it would be good to see how people react; it wouldn't bother me" and lastly those who wanted the (3) "filming to cease immediately". The majority who agreed to being recorded did not want anyone but the surgeons immediately involved to view potential images (65.1%). The large majority of those willing to be recorded despite gender or age wanted a postoperative debrief (66.3%). The final white space question offered participants the opportunity to leave "Any further comments …" The response rate was extremely poor with only 20 participants (10.69%) leaving constructive thoughts. These broadly fell into 5 themes; social acceptance, good idea, concerns around privacy/sensitivity, those unwilling and those deemed thought provoking. Answers are reported in Table 2.

Table 4
Privacy affected by being filmed?



		Affect privacy		Sig.
		No (%)	Yes (%)	
Quartiles	1	11 (31.42)	24 (68.58)	p=0.013
	2	28 (63.63)	16 (36.37)	
	3	31 (63.26)	18 (36.74)	
	4	29 (63.04)	17 (36.96)	

Subsequently patients were divided in quartiles according to age (I quartile: under 52 years of age; II quartile: between 52 and 66 years of age; III quartile: between 66 and 75 years of age; IV quartile: over 75 years of age.

According to quartiles, we found a statistically significant differences in four questions of the questionnaire: willing to be filmed; privacy affected if being filmed; number of staff present during recording; if images have to be left. Results are presented in Tables 3–6 and our data showed a better propensity of older people to potentially participate in digital recording for teaching purposes.

Finally, we tested if sex influenced the results of the questionnaire, these are presented in Table 7. In general, males were more inclined to participate in real time digital recording. When evaluating gender difference statistical significance was observed in two items: If you were potentially filmed would you want your face excluded? 34% of male patients verses 15.90% of female patients *would* allow themselves to be filmed without excluding their face, $p = 0.016$. Secondly, 80.64% of male patients verses 62.50% of female patients *would* allow themselves to be recorded even if complications occurred, $p = 0.050$. No statistically significant differences were found in other items.

4. Discussion

The questions addressed by the study were fourfold; does gender influence patients willingness to consent to real time digital recording of urological procedures for research and teaching purposes? Does age influence patients willingness to consent to real time digital recording of urological procedures for research and teaching purposes? Is real time digital recording of urological procedures for research and teaching purposes socially acceptable? What percentage of our sample necessitate a formal debrief post real time digital recording?

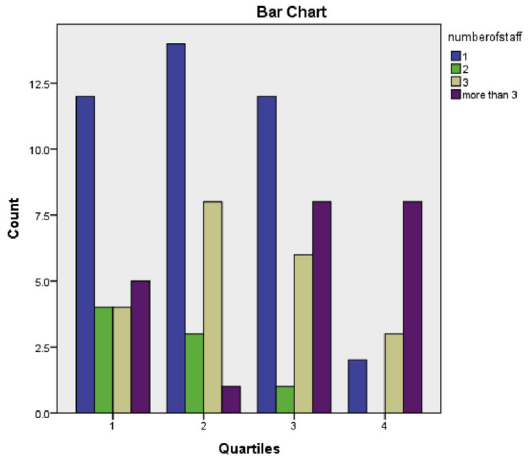
The principal results are as follows; older patients are most willing to consent to potential recording. Male patients showed a better propensity to participate. Greater than 50% of our sample believe being recorded is intrusive but the majority do not think privacy is an issue. Lastly, the vast majority would require a formal debrief post operatively.

The first question addressed by the present study concerned age and whether this was an influencing factor in patients willingness to consent. Our study showed that age does influence consent, with those older being more likely to consent. The effect age has on participation in research is poorly represented in current literature, and when available has diverse methodology. However, Hill et al.'s [15] findings were consistent with ours. In their systematic review they too found older patients more likely to consent in study participation. However, Hoover-Regan et al. [16], investigated oncological and non-oncological study participants *understanding* of the clinical trial they were currently enrolled in. They found patients over 60 had the least knowledge. The motivation behind such blind consent may include the belief that doctors are acting in patients best interests or perhaps misguided thoughts that consent might "speed up their treatment" as one of our participants queried. It has also been hypothesised that patients are often anxious not to disappoint their surgeon [17] leading to reluctant consent. Kho et al. [17], investigated whether informed consent for use of data from medical records introduces selection bias by examining differences in key personal characteristics between participants and non-participants. Although the study designs included in their systematic review are different from ours they were the closest representation we found. Their results showed clear gender and age differences regarding consent in the studies included, but, no significant clear pattern was apparent. Our results suggest that the younger population should be targeted in the future through education and reassurance surrounding potential use of material and anonymity. Hoover-Regan et al. [16], suggest the most beneficial way is a one-to-one meeting with the potential study participants and a research staff member. Another method argued to enhance participants knowledge of research is through audio-visual presentations. However, a recent Cochrane Review on such methods concluded its value was "unclear" [18].

The second question addressed genders influence on willingness to consent to real time digital recording of urological procedures. Our results indicate that males are more willing to be recorded regardless of age (Table 7). Again there is a shortage of evidence to either support of argue against these findings. Kho et al's., [17], systematic review located fourteen studies that gave details surrounding consent and gender. Ultimately they acknowledged a lack of consistency "in the direction and magnitude of effect" and the cause for differences between genders were indeterminate. Hill et al. [15], found the opposite to our findings and suggest that older males are in fact more likely to consent to study participation. It must be noted however that this study was looking at the use of medical record data and as such comparisons cannot ready be made.

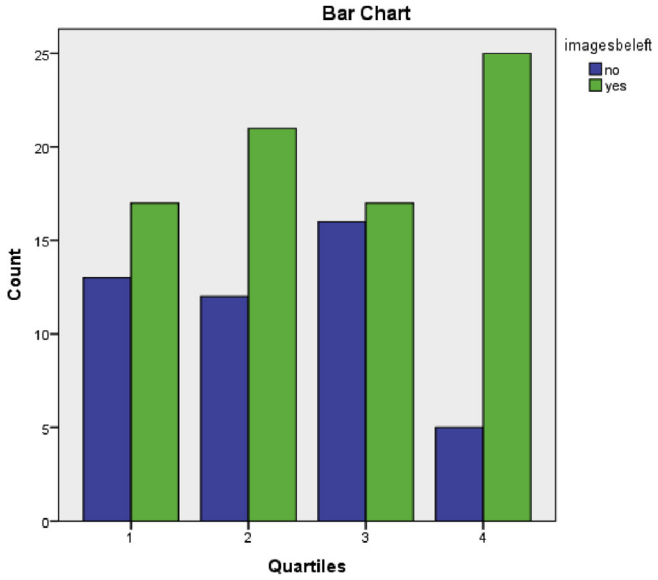
The third question concerned whether potential real time digital recording of urological procedures for research and teaching purposes was intrusive and affected privacy. In this study we provide evidence that >56% of the sample did not believe it affected privacy

Table 5
Number of staff present at filming?



		Number of staff				Sig.
		1 (%)	2 (%)	3 (%)	More than 3 (%)	
Quartiles	1	12 (48.00)	4 (16.00)	4 (16.00)	5 (20.00)	P=0.005
	2	14 (53.84)	3 (11.53)	8 (30.76)	1 (3.84)	
	3	12 (44.44)	1 (3.70)	6 (22.22)	8 (29.62)	
	4	2 (14.28)	0 (0.00)	3 (21.42)	8 (57.14)	

Table 6
Images to be left in if complications arose?



		Images to be left		Sig.
		no	yes	
Quartiles	1	13 (43.33)	17 (56.67)	p=0.040
	2	12 (36.36)	21 (63.64)	
	3	16 (48.48)	17 (51.52)	
	4	5 (16.66)	25 (83.34)	

(Table 1). However, >50%, despite gender, believed being recorded is intrusive.

A minor proportion of the sample gave conflicting results when answering questions regarding privacy and the intrusive nature of potential real time digital recording. A small percentage believed the process to affect privacy and be intrusive, but still consented to being filmed (Table 1). We suggest two possible explanations for this; firstly perhaps a lack of understanding regarding the questions through possible ambiguity or perhaps even functional illiteracy. Functional illiteracy is defined as the ability to read and write simple sentences but be unable to function fully within ones society [19]. It is quite possible that some of our participants were functionally illiterate. Addressing such issues is complicated and no single strategy is known to significantly increase understanding throughout this population [20]. Secondly, perhaps patients are willing to consent to things they deem unacceptable through unsubstantiated fear of negative future outcomes e.g. delayed operation.

The fourth question investigated what percentage of our sample necessitate a formal debrief following potential real time digital recording? In this study we have found that between 76 and 77% of the sample, regardless of age or gender would like a formal debrief (Table 1). The large percentage of the sample wishing to have the opportunity for a formal debrief was an unexpected and surprising finding. It is of course standard practice to inform the patient of intraoperative findings and perioperative expectations. However, the large majority wanting a debriefing will add huge time pressures on already overloaded health care professionals. The time needed to describe the process and explain images in lay-terminology would place huge time constraints on both consultants and advanced surgical trainees. In turn many may feel the time demands outweigh the educational benefits of such a tool.

The findings in this study are limited to the urological population only. Seeing as urological procedures are unique in their intimate nature and possible negative social taboos, we acknowledge findings cannot be extrapolated to the wider surgical population. Ultimately, as previously demonstrated by several authors [3,13,21,22,23] the use of recorded images coupled with expert feedback leads to better educational outcomes for students. It is therefore already known that this is a valid technique to educate advanced surgeons [24–26]. Our results show that in order for this to become socially acceptable several factors need to be addressed.

5. Conclusion

Our results show that a percentage of the public are willing to be digitally recorded for research and educational purposes, however, there are caveats. The large number of patients who requested a formal debrief may be the defining factor in this form of education becoming a valid method. The time and cost to debrief all patents would be vast. Regardless, we believe with more patient education regarding this method many worries would dissipate and less would in fact demand such an in-depth debrief. We have also highlighted several areas of possible future research, namely the reluctance behind young urology patients to consent and questions regarding how best to educate possible study participants to ensure proper *informed* consent is gained.

Table 7
Gender comparison to questions answered.

Questionnaire questions	Male (%)	Female (%)	Sig.
Would you be willing to have your treatment filmed for research purposes?			0.121
No	56 (41.48)	15 (32.60)	
Yes	79 (58.52)	31 (67.40)	
Do you feel the public may think filming patients is intrusive?			0.550
No	59 (45.73)	20 (44.44)	
Yes	70 (54.27)	25 (55.56)	
Do you feel this would affect your privacy and dignity?			0.791
No	77 (57.46)	30 (60.00)	
Yes	57 (42.54)	20 (40.00)	
When being filmed do you feel discussing your Past Medical History (PMH) is appropriate?			0.571
No	30 (24.39)	11(23.91)	
Yes	93 (75.61)	35(76.09)	
Do you feel discussing your PMH may compromise confidentiality?			0.788
No	87 (68.50)	34 (73.91)	
Yes	40 (31.50)	12 (26.09)	
If you were potentially filmed would you want your face excluded?			0.016
No	42 (34.42)	7 (15.90)	
Yes	80 (65.58)	37 (84.10)	
Do you feel the surgeons should be anonymised to protect patient confidentiality?			0.153
No	71 (57.25)	31 (67.39)	
Yes	53 (42.75)	15 (32.61)	
How many staff present during potential filming?			0.819
1	31 (43.05)	13 (46.72)	
2	7 (9.72)	1 (3.57)	
3	16 (22.22)	5 (17.85)	
More than 3	18 (25.01)	9 (31.86)	
Would you prefer the filming to be carried out by a same sex operator?			0.080
No	65 (59.63)	18 (45.00)	
Yes	44 (40.37)	22 (55.00)	
If you were unconscious, would you be happy for your next of kin to agree to your treatment being filmed?			0.542
No	41 (35.65)	15 (34.88)	
Yes	74 (64.35)	28 (65.12)	
Would you want to view footage prior to use?			0.395
No	27 (24.32)	12 (27.90)	
Yes	84 (75.68)	31 (72.10)	
Would you like an opportunity to ask questions and be debriefed?			0.460
No	19 (17.59)	6 (15.00)	
Yes	89 (82.41)	34 (85.00)	
Would you prefer images to be left in the recording if complications arose?			0.573
No	36 (36.36)	13 (36.11)	
Yes	63 (63.64)	23 (63.89)	
Would you mind medical/surgical colleagues viewing the recordings?			0.210
No	86 (78.18)	36 (85.71)	
Yes	24 (21.82)	6 (14.29)	
Would you want filming to stop if complications arose?			0.050
No	50 (80.64)	15 (62.50)	
Yes	12 (19.36)	9 (37.50)	

Conflicts of interest

None.

Sources of funding

None.

Ethical approval

The study was approved by internal committee: CA14-077.

Research registration unique identifying number (UIN)

Not required.

Author contribution

Dr. Sharp contributed to the conception and design of the studies; acquisition of data; analysis and interpretation of data; drafting and revision of the manuscript critically for important intellectual context; and, provided final approval of the manuscript.

Dr. Mazzon contributed to analysis and interpretation of data; drafting and revision of the manuscript critically for important intellectual context and provided final approval of the manuscript.

Dr. Thilagarajah contributed to the conception and design of the studies; interpretation of data; revision of the manuscript critically for important intellectual context; and, provided final approval of the manuscript.

Guarantor

Guarantor: Dr Ranjan Thilagarajah.

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