

Survey About Knowledge, Interest and Attitude Towards Notes Among Surgeons in Taif, Saudi Arabia

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ABSTRACT

Introduction: NOTES merges endoscopy with laparoscopy, minimizing the drawbacks of laparoscopy. There are no external incisions, lesser pain and post-operative hospital stay. This study was done to assess awareness among surgeons about NOTES.

Methodology: Cross-sectional, questionnaire study done on 64 surgeons in Taif during early 2018. The questionnaire had 18 MCQ's where we asked surgeons about their knowledge and attitude towards NOTES. Results were expressed as percentages. **Results:** 37.5% surgeons said NOTES cannot become mainstream procedure while 29.7% and 28.1% said it would take 10 and 6 years, respectively. 68.7% said NOTES is costly. 43.75% said NOTES has more complications than laparoscopy. 6.25% said post-operative pain would be more in NOTES compared to laparoscopy. 21.87% said NOTES requires longer time for full activity. 50% were in favour of NOTES if they are given proper training and facilities. These surgeons would not prefer NOTES if the cost is high or the patient needs to be shifted to another hospital. 68.7% surgeons would not prefer NOTES for themselves.

Conclusion: Interest of surgeons in Taif towards NOTES is low. Extensive orientation of surgeons on this procedure and adequate training is mandatory to create awareness which could possibly be more beneficial to patients as well as surgeons.

Key words: Notes, Natural orifice transluminal endoscopic surgery, Awareness, Knowledge, Attitude

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INTRODUCTION

The progress of minimally invasive surgery and the improvement in endoluminal flexible endoscopy have focused to generate a new idea in digestive surgery in which a hollow organ is pierced to gain access to the peritoneal cavity. This tactic, whose acronym natural orifice trans-luminal endoscopic surgery (NOTES) purposed to decrease the complication of surgical trauma to a minimum. Since defined by Kalloo et al in 2004, it has enticed major interest from surgeons and flexible endoscopists [1,2]. NOTES show one of the best important innovations in surgery to stand out since the presentation of laparoscopy. Even after years of improvement with this technique, its clinical application remains controversial [3]. Day in day out NOTES is getting buffed and technical barrier is being broken [4]. The procedure requires skills of an experienced endoscopist working together with an experienced surgeon. It requires inlet into the abdominal cavity via trans-oral, trans-colonic, trans-vesical or trans-vaginal routes. Since its inception, many researches on

animal models have been published, where cholecystectomy, liver biopsy, splenectomy gastro-jejunoscopy and tubal ligation have been performed via trans gastric route [5]. The first NOTES surgery in human was trans gastric appendectomy which was presented by Rao and Reddy in 2004 (unpublished) during the annual meeting of the American Society of Gastrointestinal Endoscopy (ASGE) [6]. Surgery via NOTES technique in humans have also been successful for splenic surgery, cholecystectomy, nephrectomy, appendectomy, ovarian cysts, hernia repair and tubal surgery [7].

The definitive goal of laparoscopic surgery is minimizing the number of abdominal incisions, also it has other advantages including reduced hospital stay, decreased post-operative pain and faster return to routine activities [8]. NOTES further minimize the drawbacks of laparoscopic surgeries as there are no external incisions, less pain and lesser post-operative hospital stay compared to laparoscopic surgeries [9].

Experiments on NOTES have increased in the preclinical settings. Its applications in humans have also been increasing since the past decade. But we should lower our enthusiasm for NOTES because it has certain NOTES specific morbidity. The patient preferences in regard of

this new technique should be thoroughly considered by the surgeons as its reliability is still unproven. There are two major technical issues with NOTES, one of them is the difficulty in access to closure and the second one is the risk of contamination by microbial infection [3,7].

The clinical applications of NOTES are surmised to increase as surgeons are surpassing its technical limitations. Surgeries via NOTES in humans are to be done exclusively by experts and the outcomes must be recorded in a registry [3]. Research today is racing to study various NOTES techniques. To understand the enthusiasm of surgeons about NOTES, we decided to take a questionnaire survey of interest of surgeons in NOTES in Taif, Saudi Arabia. Where we asked them about their knowledge their acceptance about NOTES.

MATERIALS AND METHODS

We had done a questionnaire based cross sectional study in Taif, Saudi Arabia. Study participants were surgeons working in King Faisal Hospital, King Abdul Aziz Specialist Hospital and Al-Hada Military Hospital. This study was done in early 2018. Prior permission from ethics committee of the above three institutes was obtained before beginning the study. This questionnaire had two sections where in the first section we asked about surgeon's demographic information, in the next section there were 18 questions of MCQ type. Few

questions had only yes/no as options and for few questions multiple options were given and surgeons were requested to choose only one option. These multiple option questions were to assess participant's knowledge and attitude toward NOTES [10]. (Appendix 1).

Questionnaire sheets were distributed to the surgeons at their workplace. They were requested to fill the sheets and handover immediately. Participants were explained the motive of study and written consent was taken before giving questionnaire. Surgeons not willing to participate and incomplete responses were excluded from the study.

Statistical analysis

The number of responses for an option of a question were counted. This data was entered into MS excel. The numbers were converted to percentages.

RESULTS

Among 70 surgeons; 64 surgeons completed the questionnaire and 6 refused to take the survey. The median age of surgeons was 32 years. Regarding Surgeon practice by years; 20 (31.25%) of them had <5 years, 24 (37.5%) had 6-10 years, 16 (25%) had 11-20 years and 4 (6.25%) had 21-30 years of practice (Table 1).

Table 1: Percent of procedures performed laparoscopically by respondents?

Percent of procedures	0%	<10%	10-25%	26-50%	51-75%	>75%
No of surgeons and %	11 (17.18%)	11 (17.18%)	16 (25%)	15 (23.4%)	5 (7.8%)	4 (6.25%)

11 (17.18%) of surgeons in this study performed open surgery only, while 53 (82.8%) performed both laparoscopy and open surgery. 100% of surgeons were familiar with laparoscopic surgery before this study, while only 24 (37.5%) of surgeons were familiar with NOTES before this study. 60 (93.75%) surgeons agreed that minimally invasive approaches are currently available for the surgeries they commonly performed.

According to prediction by Taif surgeons concerning the approximate period for NOTES to become one of the main approaches for abdominal surgeries; 3 (4.6%) respondents said 3 years, 18 (28.1%) said 6 years, 19 (29.7%) said 10 years and 24 (37.5%) said never.

44 (68.7%) respondents in this study said NOTES is more in cost, 32 (50%) said open surgery has more complications while 28 (43.75%) respondents said NOTES have more complications. 56 (87.5%) surgeons agreed that open surgeries have more post-operative pain, while 4 (6.25%) respondents said laparoscopic surgery has more post-operative pain and another 4(6.25%) surgeon said NOTES has more post-operative pain. 14 (21.87%) surgeons believe that NOTES will take more time to return to full activity level but 6 (9.37%) surgeons said that laparoscopic will take more time for a patient to return to full routine activity (Table 2).

Table 2: NOTES in comparison with laparoscopic and open surgery.

	Open surgery	Laparoscopic surgery	NOTES
Which is high in cost	(2) 3.1%	(18) 28.1%	(44) 68.7%
Which has more complications	(32) 50%	(4) 6.25%	(28) 43.75%
Which has more length of hospital stay	(56) 87.5%	(4) 6.25%	(4) 6.25%
Which has more postoperative pain	(56) 87.5%	(4) 6.25%	(4) 6.25%
Which takes more time to return to full routine activity level	(44) 68.75%	(6) 9.37%	(14) 21.87%

Respondents when asked about assuming NOTES was feasible, available in your hospital and if they were trained to perform NOTES, would they choose to perform NOTES rather than laparoscopy as the preferred surgical approach; surprisingly only 50% said yes to NOTES. Among the 50% who were interested in NOTES would not use NOTES under certain circumstances (Table 3).

Most surgeons think that NOTES approach is more suitable for adult patients only and 25% of them believe

that it might be best for anyone. While 64% of the respondents think the laparoscopic approach might be best for anyone (Table 4).

68.7% of surgeons in our study would not choose NOTES cholecystectomy for himself or for any of his family member if they needed gallbladder surgery and would prefer laparoscopic cholecystectomy instead.

Table 3: The surgeons who had accepted to perform NOTES but have some considerations.

Would you still use it as your approach of choice if?	Yes	No
The complications rate was higher	11 (34.3%)	21 (56.6%)
The patient must pay significantly more (\$100-1000\$)	16 (50%)	16 (50%)
The necessity of transfer the patient to another hospital in your town	29 (90.6%)	3 (9.3%)
The necessity of transfer the patient to another hospital 500 miles away	7 (21.8%)	25 (78.1%)

Table 4: NOTES and laparoscopic surgery is best approach for.

	Infants	Children	Adults	Elderly	Anyone	No one
laparoscopic approach might be best for	0 (0%)	0 (0%)	18 (28.1%)	5 (7.8%)	41 (64%)	0 (0%)
NOTES approach might be best for	0 (0%)	0 (0%)	25 (39%)	4 (6.25%)	16 (25%)	19 (29.6%)

DISCUSSION

With an intentional disruption of a hollow viscus and entry into peritoneum, NOTES is one of the most controversial topics in gastrointestinal surgery. Multiple previous surveys demonstrated mixed opinions of patients regarding this new approach [11]. To our knowledge, few studies have examined surgeon's opinion about this approach and so far, no studies have been conducted in Saudi Arabia. So, the main goal of this study is to assess interest of surgeons in NOTES in Taif city, KSA. This study also aimed at studying the surgeons' acceptance of this kind of surgeries and identify any potential barriers for its adoption. Despite successfully performing NOTES, this technique remains highly challenging and the pragmatism of its use remains speculative [12].

All surgeons in our study were familiar with laparoscopic surgery, while only quarter of them were familiar with NOTES before this study. Given the intense interest in NOTES and it is potential to revolutionize current surgical therapy, several working groups have been formed to help guide NOTES research and clinical development. Among them, the Natural Orifice Surgery Consortium for Assessment and Research (NOSCAR) published a landmark 'white paper' in 2006 outlining the perceived barriers to the clinical adoption of NOTES [7]. In our study the prediction of Taif surgeons concerning the approximate period to NOTES becoming one of the main approaches for abdominal surgeries was 6-10 years. 37.5% of respondents said it will never become one of the main surgical approaches.

In this nascent era of NOTES in human beings, it is unclear how these surgical techniques will be implemented. The concept of fewer surgical incisions and less postoperative pain and faster recovery resonates with most surgeons [13]. Surgeons in our study had the same belief that it would be associated with less pain and shorter recovery time.

When comparing NOTES with laparoscopic and open surgery, cost of the procedures was the most important concern for surgeons participating in our study. Their next concern was the complication which is nearly the same with open surgery. They believe that there is a high risk of the NOTES surgeries to be contaminated by microbial infection. In the study of John et al., barriers of NOTES transvaginal cholecystectomy included cost, difficulty in performing these procedures, perception of increased risk, lack of critical instrumentation, and a lack of appropriate training [13].

Only 50% of surgeons in our study chose NOTES over laparoscopy if it is available and if they are trained. Thus, clarification of the advantages of the procedures and training is an especially important issue which may increase interest of our surgeons. According to Romanelli et al., the core tasks necessary to perform NOTES were exposition and clarification, and then applying the concepts to the future training of surgeons interested in it [13].

Among the 50% who would use NOTES approach in our study, there believed in certain obstacles that would prevent them from using NOTES; 78.1% of the respondents will not use this technique if it necessitates

transfer of the patient to another hospital miles away, 50% will not use this technique if the patient has to pay significantly more and 56.6% of surgeons will not use it if the complications rate was higher. Its strongly believed that, for the adoption of new technologies and introducing new procedures, hospitals support should be granted. Also, direct case observation may be helpful to gain insight into the technical difficulties and instrument needs of these procedures [13].

Majority of surgeons (68.7%) in our study would not elect NOTES cholecystectomy for themselves or for their family member if they needed gallbladder surgery and would prefer laparoscopic cholecystectomy instead. This is nearly like the finding of previous study by Volckmann *et al.* [10].

Despite years of improvement in this technique, its clinical application remains controversial, so training in NOTES will be a key issue in the future. The experience of British society of gastroenterology towards endoscopic training are good models for future education.

CONCLUSION

NOTES is undoubtedly a promising procedure for the future. We believe that the interest of our surgeons to NOTES is still low. To break the barrier for the widespread adoption of NOTES, and to increase the interest to this minimally invasive procedure, extensive orientation of surgeons on this procedure and adequate training are mandatory. Multidisciplinary teams may speed the learning process and afford complementary skill sets. Also, more clinical studies and creation of new NOTES-specific instruments will make NOTES a reality.

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CONFLICT OF INTEREST

All authors declare no conflicts of interest.

REFERENCES

1. Kalloo AN, Singh VK, Jagannath SB, *et al.* Flexible transgastric peritoneoscopy: A novel approach to

diagnostic and therapeutic interventions in the peritoneal cavity. *Gastrointest Endosc* 2004; 60:114–117.

2. Gee DW, Rattner DW. Natural orifice transluminal endoscopic surgery: Current status. *Adv Surg* 2009; 43:1–12.
3. Atallah S, Martin-Perez B, Keller D, *et al.* Natural-orifice transluminal endoscopic surgery. *Br J Surg* 2015; 102:73-92.
4. Dhillon KS, Awasthi D, Dhillon AS. Natural orifice transluminal endoscopic surgery (hybrid) cholecystectomy: The dhillon technique. *J Minimal Access Surg* 2017; 13:6.
5. Babatin M. NOTES: Evolving trends in endoscopic surgery. *Saudi J Gastroenterol* 2007; 13:207.
6. Moreira-Pinto J, Lima E, Correia-Pinto J, *et al.* Natural orifice transluminal endoscopy surgery: A review. *World J Gastroenterol* 2011; 17:3795–801.
7. Rattner D, Kalloo A, ASGE/SAGES Working Group. ASGE/SAGES Working group on natural orifice transluminal endoscopic surgery. *Surg Endosc* 2006; 20:329–333.
8. Litwin DEM, Cahan MA. Laparoscopic cholecystectomy. *Surg Clin North Am* 2008; 88:1295–313.
9. Bulian DR, Knuth J, Cerasani N, *et al.* Transvaginal/transumbilical hybrid--NOTES--versus 3-trocar needlescopic cholecystectomy: Short-term results of a randomized clinical trial. *Ann Surg* 2015; 261:451–458.
10. Volckmann ET, Hungness ES, Soper NJ, *et al.* Surgeon perceptions of natural orifice transluminal endoscopic surgery (NOTES). *J Gastrointest Surg* 2009; 13:1401–1410.
11. Young MT, Selzer DJ, Belcher DW. W1644 patient interest in natural orifice transluminal endoscopic surgery (NOTES) as an alternative to laparoscopic cholecystectomy. *Gastroenterol* 2010; 138:894-895.
12. Kaouk JH, Haber GP, Goel RK, *et al.* Pure natural orifice transluminal endoscopic surgery (NOTES) transvaginal nephrectomy. *Eur Urol* 2010; 57:723–726.
13. Romanelli JR, Desilets DJ. Training and credentialing in NOTES (Natural Orifice Transluminal Endoscopic Surgery). *Current Surg Reports* 2013; 1:228–232.