Expectations of Hepato-Pancreato-Biliary Fellows; Do We Meet Them?

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OBJECTIVE: There are 16 accredited hepatopancreatobiliary (HPB) fellowships in North America. The purpose of this study is to portray the expectations of the incoming HPB fellows about their training and its implication on their career.

DESIGN: A 29-questions survey was sent out to all HPB fellows starting in August 2017. The survey was divided in 3 sections depicting background, in-training and post-fellowship expectations. Descriptive statistics were generated for aggregate survey responses.

SETTING: This study was performed through an online questionnaire that was sent to the participants via e-mail. The answers were processed in our offices in Methodist Richardson Medical Center, in Richardson, Texas which is a private tertiary medical center part of the Methodist Health System.

PARTICIPANTS: Participants were all incoming HPB Fellows (In HPB fellowship programs accredited by the Fellowship Council) starting their fellowship in August 2017.

RESULTS: We had a 94% response rate. Forty-six percent of fellows anticipate doing about 150 to 250 HPB cases during the fellowship, and all 15 fellows anticipate having at least 1 publication during fellowship. Despite that >90% of fellows believe that minimally invasive surgery (MIS) approaches will be more frequently utilized in HPB surgery, only 3/15 anticipate being able to apply MIS techniques and only 54% will be robotically trained. Interestingly the majority of fellows believe that the attending should be performing the case the first few months.

CONCLUSION: The trainees believe that case volume is the most important factor for choosing a fellowship and for adequate training. Most of the fellows anticipate doing adequate number of cases but only the minority feels they will be adequately trained in MIS-robotic techniques. (J Surg Ed 76:1546–1555. © 2019 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: Hepato-pancreato-biliaty fellowship, surgical education, minimally invasive surgery, robotic surgery training, autonomy during fellowship

COMPETENCIES: Medical Knowledge, Professionalism, Practice-Based Learning and Improvement

INTRODUCTION

Hepato-Pancreato-Biliary (HPB) surgery is a highly technical and challenging subspecialty of general surgery and surgical oncology. Graduates of general surgery programs who want to pursue a career in the surgical management of diseases of the liver, pancreas and biliary system often seek additional training in the form of a fellowship either through HPB surgery fellowships, Surgical Oncology fellowships, or Transplant fellowships. The Fellowship Council (FC) is the accrediting organization for HPB fellowships and defines the minimum requirements for adequate HPB training in association with the American Hepato-Pancreato-Biliary Association (AHPBA). In 2017, there were 16 accredited HPB fellowship programs in North America (USA and Canada) that are 1 or 2 years in length. The total number of fellowships fluctuating every year as new fellowships are added, old ones withdraw and some fellowships accepting fellows every other year.[16]

As stated in previously published literature, general surgery residency often inadequately trains graduates for practice.[1] Mattar et al. in his survey of fellowship

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program directors reports that program directors commonly feel that incoming fellows lack patient ownership, come unprepared to the operating room and could not operate for more than 30 minutes unsupervised in a major procedure.[1] On the other hand, Osman et al. supports that trainees who enter HPB fellowships feel they are prepared and managed to do so by spending extra time during residency in that specific subspecialty.[2] Additionally when the HPB fellows perceptions are compared to those of their program directors, close to the end of their fellowship, there was a relatively good alignment in regards to adequate case volumes, and perceived weaknesses in fellows operative abilities.[3] Reviewing the literature, it is easy to realize that there is a lack of data about the expectations of the trainees who match in HPB fellowships regarding their training. The goal of this study is therefore to define what expectations the fellows have at the beginning of their training, regarding the case volume, exposure in specific techniques such as robotic approaches, research opportunities, operative autonomy during their training and others. We also sought to evaluate differences among the fellowships and what do the fellows intend to do after the completion of their fellowship.

METHODS

After Institutional Review Board approval was obtained, all 16 current fellows in the Fellowship Council accredited HPB fellowships in the US and Canada were invited to participate. A questionnaire consisting of 29 questions was developed and subsequently converted to an online survey format. It was tested to ensure clarity and consistent interpretation. An online link to this survey was sent out utilizing online electronic survey software (SurveyMonkey. SurveyMonkey Inc. Palo Alto CA).

The survey was composed of 3 sections with 29 questions total (Fig. 1). The first section included 10 questions inquiring about the background of the fellows and included questions like why did they decide to do an HPB fellowship, how did they choose a specific fellowship, how did they prepare for it during residency, how many HPB cases had they done prior to fellowship, how ready they felt at the beginning of the fellowship and if the fellowship setting was as expected. The second part of the survey consisted of 15 questions regarding the fellows' expectations during their fellowship. It included questions about anticipated case numbers, exposure to minimally invasive and robotic techniques, ideal duration of the fellowship, participation in research projects, and level of autonomy and independence in the operating room. The third part of the survey consisted of 4 questions referring to postfellowship expectations such as type of desired practice setting and ability to find an HPB job.

The answers were collected by an independent research assistant in order to assure anonymity and the results were reported for each question separately.

RESULTS

In total 15 out of 16, 2017 to 2018 HPB fellows responded to the survey for a response rate of 94%. Answering the question about who or what inspired them as residents to pursue a HPB fellowship, most fellows (10/15 − 66.7%) responded that a mentor in combination with the challenges of HPB diseases and their treatment is what made them decide. For 1 fellow the factor with the highest impact was the future of the HPB specialty. For 11/15 (73%) of fellows the HPB was their first fellowship whereas the rest 4/15 (27%) of fellows had completed a prior fellowship such as minimally invasive surgery (MIS), transplant or surgical oncology. Inquiring about how the fellows prepare for their fellowship all 15 (100%) had asked for extra HPB rotations during residency and more than 50% (8/15) of fellows responded that they have done HPB focused research and attended HPB meetings. Most fellows (53% − 8/15) had scrubbed between 20 and 50 HPB cases during residency, 40% (6/15) had participated in more than 50 cases and only 1 fellow had done less than 20 HPB cases. Despite the trend for MIS approaches in most surgical specialties most fellows (8/15 − 54%) had zero robotic experience (as a primary surgeon) during residency, 5/15 (33%) had performed less than 10 cases and only 2/15 (13%) had done between 10 and 25 cases. Only 40% (6/15) of fellow felt they were adequately prepared for their fellowship with the other 60% (9/15) feeling only "somewhat" prepared. In a question about criteria for choosing a specific fellowship our survey revealed that the decision for choosing a specific fellowship is affected by several factors with most common being the case volume (12/15 − 80%) followed by the case variety (11/15 − 73%) and the reputation of the institution (10/15 − 67%). Geographic location was important for a third of the fellows and research opportunities played a role in only 4/15 (26%) fellows (Fig. 2). As expected most fellows (8/15 − 54%) would prefer both the technical training and research opportunities during fellowship but 46% (6/15) of fellows are mostly interested in the acquiring the technical skills for HPB surgery. Interestingly 80% (12/15) of fellows matched in their first choice and for majority the fellowship met their expectations.

The second part of our survey focused on the expectations of the fellows regarding their training during the fellowship. Approximately half of the fellows (7/15 − 47%) anticipate doing between 150 and 250 HPB cases

Section A

1) Who or what inspired you or influenced you the most to pursue an HPB fellowship?
2) Did you do anything specific during residency in order to prepare for the fellowship?
3) Have you done another fellowship prior to your HPB fellowship?
4) After the first weeks in the fellowship how prepared do you thing you were from residency?
5) How many HPB cases did you do in residency?
6) How many robotic cases (all cases, not only HPB) did you do (sitting at the console) during residency?
7) What were the most important criteria for choosing a specific fellowship?
8) What are you mostly looking in an HPB fellowship?
9) Is the fellowship setting what you anticipated and in accordance to what it was presented during the interviews?
10) In what place did you rank the fellowship you matched in?

Section B

11) How many HPB cases do you anticipate doing while in fellowship?
12) How many cases do you think are enough for adequate training during fellowship?
13) How long do you think an HPB fellowship should be?
14) Do you anticipate having publications-presentations from your HPB fellowship?
15) Would you prefer to have dedicated research time with no clinical responsibilities during your HPB fellowship?
16) What do you think about the future application of MIS approaches in HPB surgery?
17) After the completion of your HPB Fellowship do you anticipate being trained to apply MIS techniques and approaches for HPB surgeries?
18) Will you be trained in **robotic** HPB surgery by the end of your fellowship?
19) If you will be training in robotic HPB surgery during your fellowship which of the following cases do you anticipate being able to perform after graduation?(check **all** that apply)
20) Do you thing is important to be trained in robotic HPB surgery during fellowship?
21) What kind of HPB cases are harder to learn how to perform?
22) What is the desired level of autonomy in the OR?
23) If in your program you perform robotic cases when do you believe you should be sitting in the operating console?
24) When do you believe you will be able to independently perform a complex **open** HPB case such a Whipple?
25) If you have robotic/lap training during your fellowship when do you believe you will be able to perform a complex **robotic/lap** HPB case independently?

Section C

26) How ready do you think you will be after the completion of your fellowship to practice HPB Surgery?
27) How confident you are, you while find an HPB job after the Fellowship?
28) Where do you want to practice after completing the HPB Fellowship?
29) Are you going to pursue additional training after the completion of your HPB Fellowship?

FIGURE 1. Questionnaire distributed to fellows online (answers not included here).

during their fellowship with 3/15 (20%) anticipating doing 250 to 350 cases, 3/15 (20%) more than 350 HPB procedures and 2 fellows less than 150 cases (Table 2). Similarly half of the fellows believe that between 150 and 200 cases are enough for adequate training with 2/15 (13%) fellows stating that someone needs 250 to 300 cases and 2/15 (13%) fellows responding that at least 300 operations are required for good training (Table 1). As far as the duration of fellowship is concerned the responses were quite mixed with a third of fellows (5/15) responding that 2 years is the ideal duration, 20% (3/15) stating that 1 year is enough and another 20% (3/15) reporting that 1or 2 years makes no difference. Sixty percent of fellows (9/15) expect that they will produce at least 1 to 2 research related publications during fellowship with 4/15 (27%) anticipating 3 to 5 publications and 2 (13%) fellows aiming for more than 6 publications. Additionally more than half of the fellows (8/15 – 54%) would prefer to have dedicated research time without clinical responsibilities but only 3 fellows stated that their program already predicts time for research.

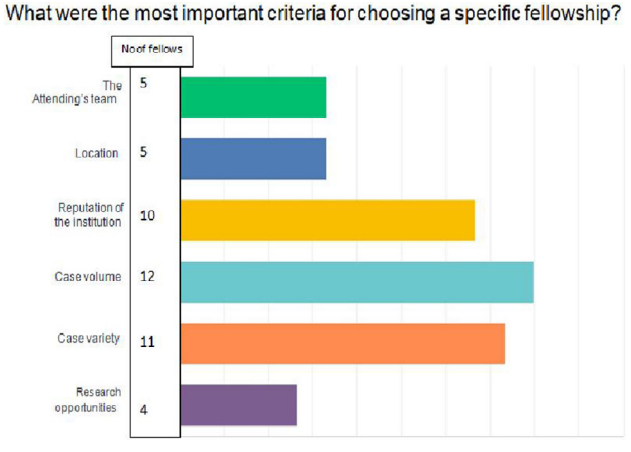
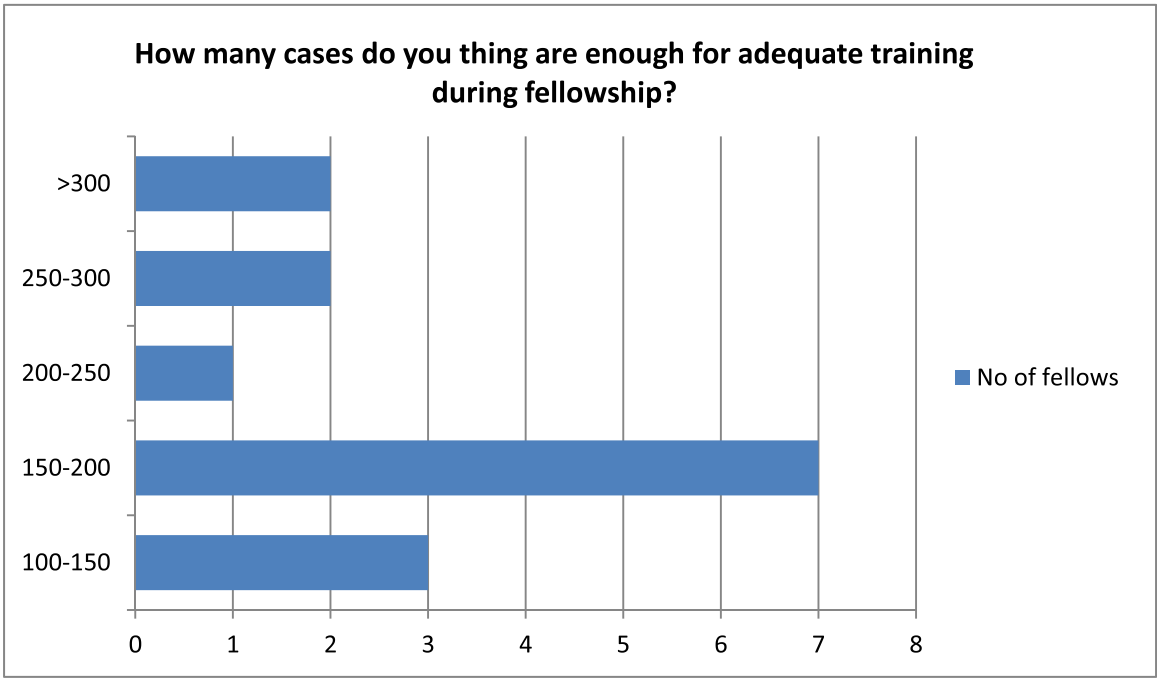


FIGURE 2. Criteria for choosing a specific program and No. of fellows.

The vast majority of current fellows (14/15 – 93%) believe that MIS approaches will be more and more frequently utilized in HPB surgery but only 20% (3/15) of them anticipate being trained to perform a big variety of HPB cases in an MIS way with the rest 80% (12/15) reporting that they anticipate being able to perform only a few

TABLE 1. No. of Cases During Fellowship for Adequate Training



specific cases with MIS techniques (Tables 3, 4, 6). As far as robotic training, a third of fellows (5/15 – 33%) believe it is extremely important to be trained in robotic HPB surgery, a third states that it will not really affect their career or future and almost half of the fellows (7/15 – 47%) report that they will have no robotic training at all

TABLE 2. No. of Anticipated Cases During Fellowship

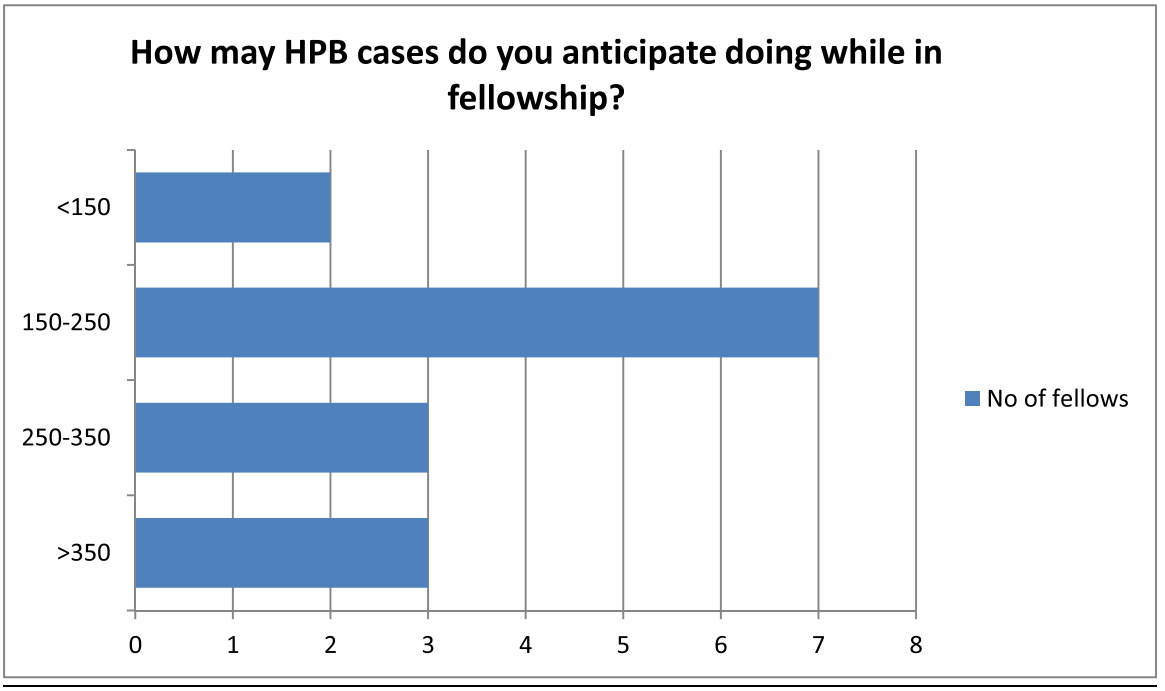
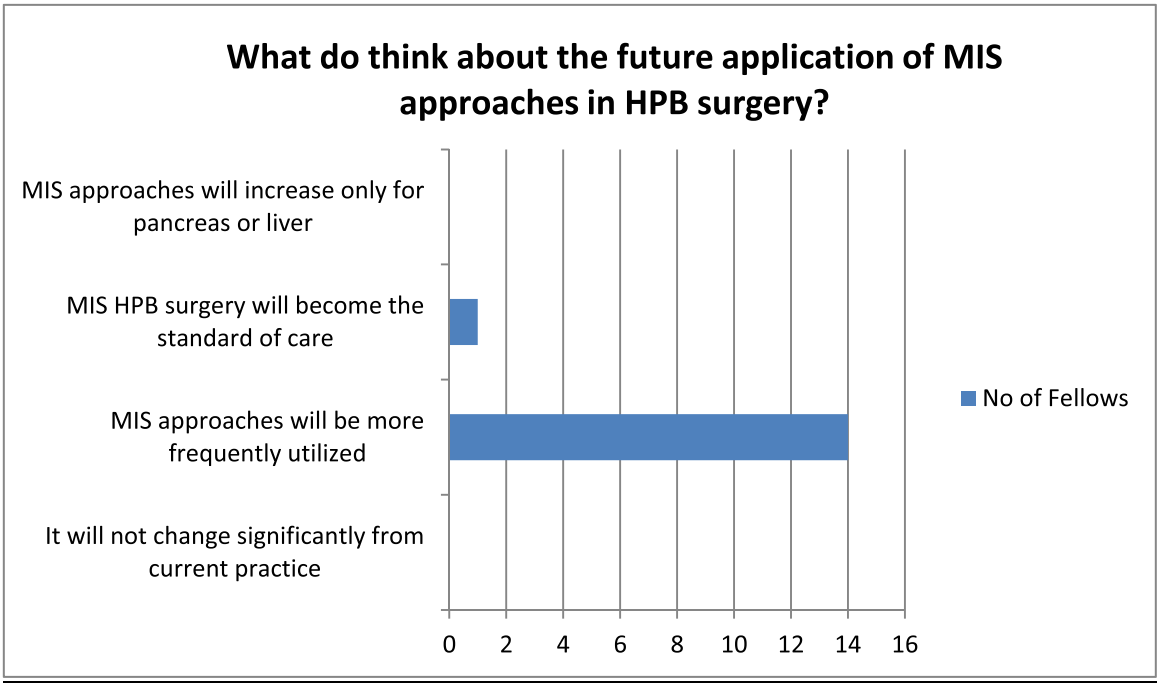


TABLE 3. Perception About Future Applications of MIS Approaches



(Table 5). Among the fellows who will be having robotic training, the majority (70%) expect to be sitting in the operating console from the first couple of cases with the rest stating that is acceptable to be performing the operation after 10 cases. More than 50% of fellows (8/15) feel that it will take close to 1 year to be ready to

TABLE 4. Importance of Robotic HPB Training

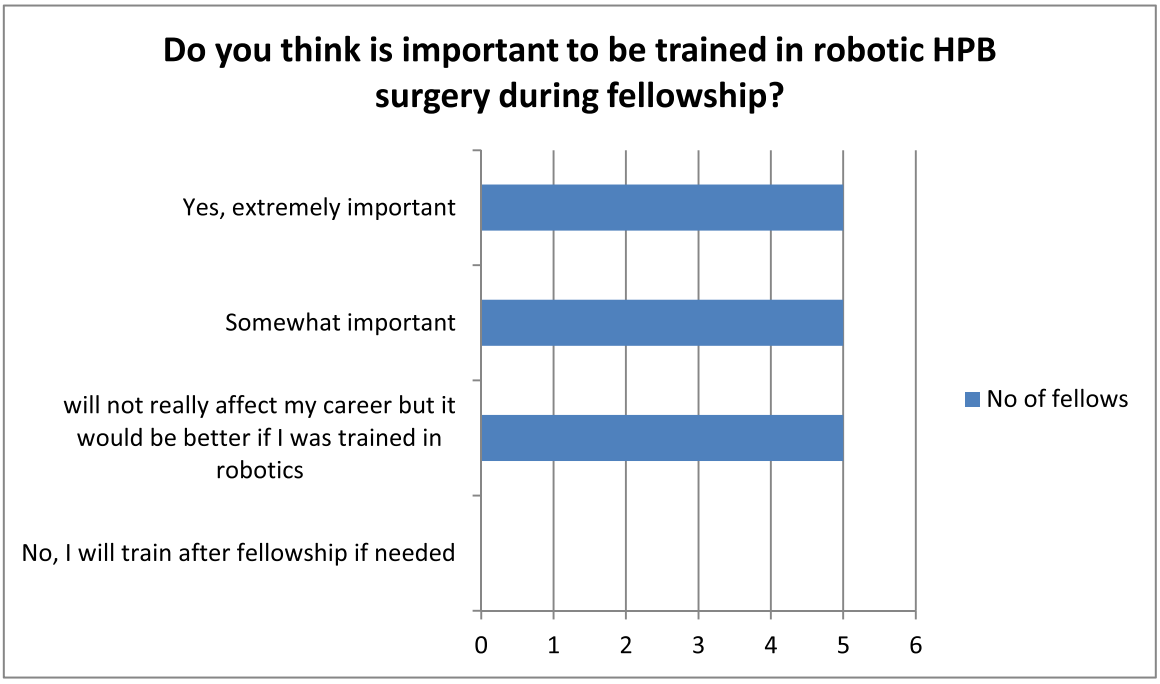
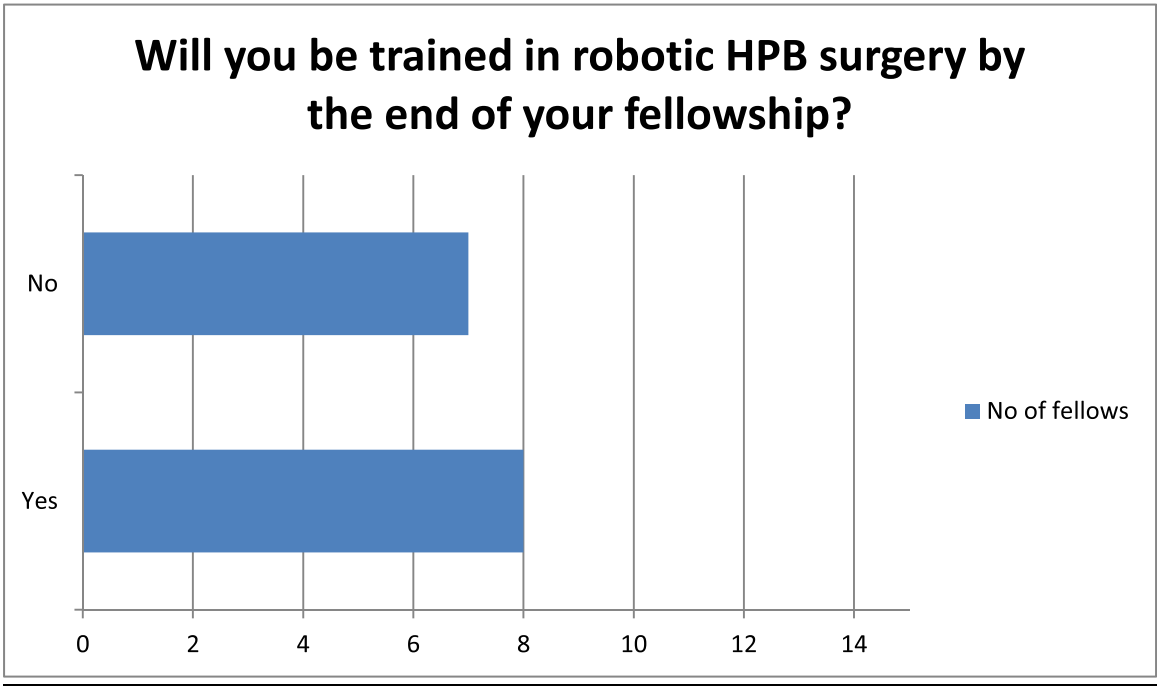


TABLE 5. Fellows Trained in Robotic HPB Surgery



independently perform a complex robotic/laparoscopic HPB case whereas only 2/15 (13%) fellows feel they will need the same amount of time for training for an open case. The majority of fellows (8/15 – 54%) anticipate being ready to perform a complex open case such as a Whipple in 3 to 6 months from the beginning of the

TABLE 6. Training in Applications of MIS Techniques

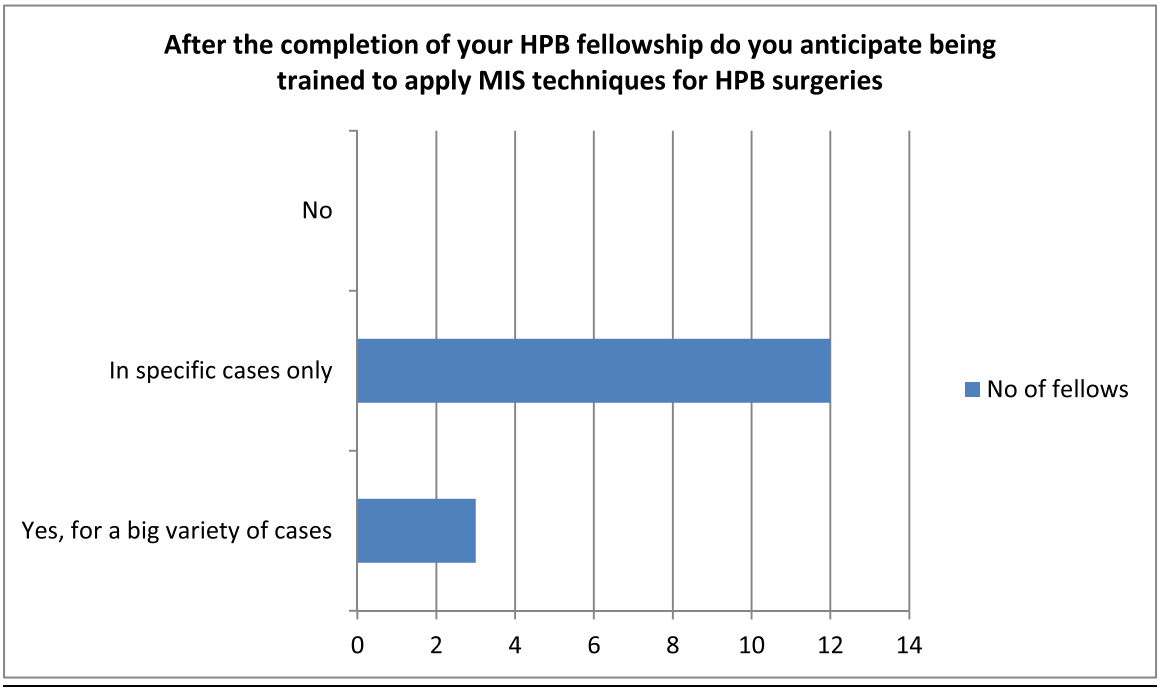
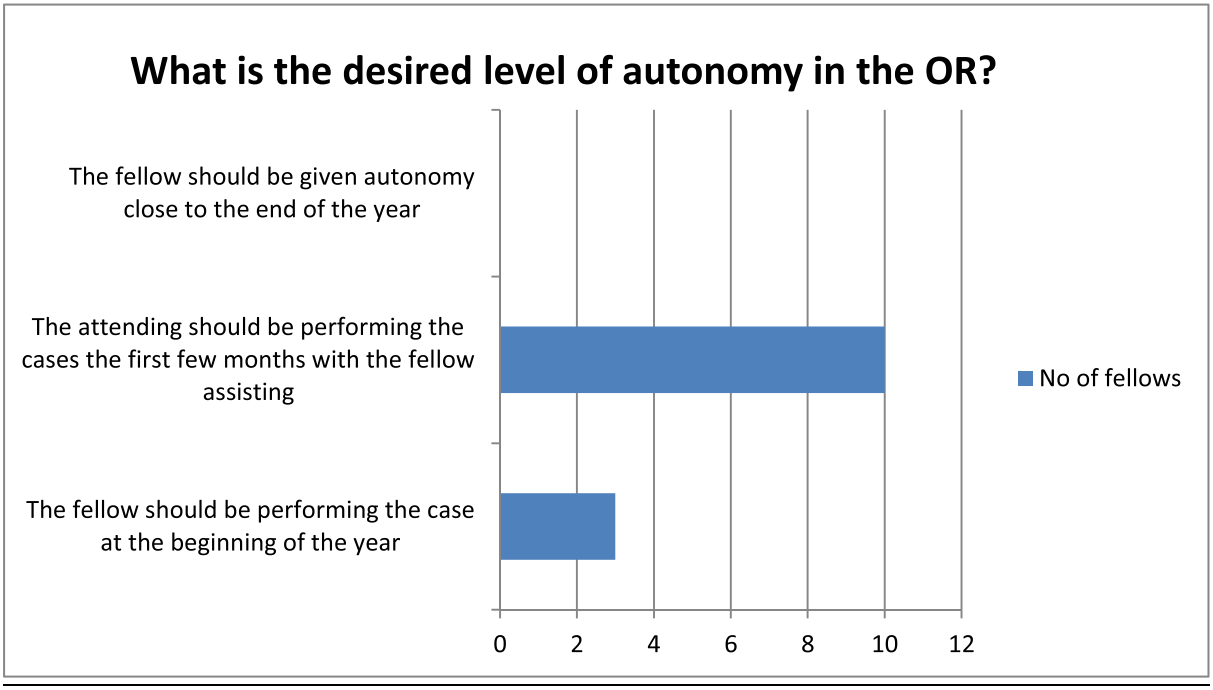


TABLE 7. Desired Autonomy



fellowship. All 15 (100%) fellows who completed the survey agreed that the hardest techniques to learn are the laparoscopic and not the robotic or open. Surprisingly the majority of fellows (10/15 – 66%) stated that the attending should be performing the case during the first few months of the fellowship and only 3 fellows believe that they should be the primary surgeon from the beginning of the year (Table 7).

The third and final part of the survey reflects postfellowship expectations. Sixty percent of fellows reported that they will be "mostly ready" to practice HPB surgery after the completion of their fellowship with the rest 40% (6/15) feeling very confident about it. Interestingly 6/15 (40%) fellows stated that they will pursue additional training after the HPB fellowship. The majority of them (13/15 – 87%) would like to practice in an academic setting and more than half of the fellows who completed the survey feel confident that they will find a job in HPB surgery whereas 4/15 (27%) fellows believe that it is unlikely to find an HPB job.

DISCUSSION

The purpose of our study was to survey the incoming HPB fellows about what do they want and expect of their training. We intended to depict what matters when they picked a specific fellowship as residents, how they prepared for it and most importantly how they expect their training to be and how it will affect their professional course immediately after the fellowship. As it is explained in detail in the paragraphs below the most important factor both for choosing a fellowship and for adequate training is case volume. Additionally the HPB fellows believe that MIS techniques are very important to learn but the majority doesn't expect to be adequately trained in them. A very interesting finding of our survey is the desired level of autonomy in the OR. Most fellows think it is reasonable for the attending to be doing the case the first few months of the fellowship.

As defined by the Accreditation Council for Graduate Medical Education, general surgery residents are required to perform, 3 pancreas surgeries, 4 liver resections, 10 biliary cases, and 50 laparoscopic cholecystectomies during their residency.[4] Since it is widely accepted that HPB surgery is technically demanding and requires intensive training and advanced surgical skills, it is reasonable that residents who want to specialize in HPB surgery pursue additional training. Currently there are 3 main pathways for focused training in HPB surgery: (1) the HPB Surgery Fellowship Programs via the FC and the AHPBA, (2) the Abdominal Transplant Surgery Fellowships via American Society of Transplant Surgeons and (3) the Surgical Oncology Fellowships via Society of Surgical Oncology.[5] Because there are no commonly followed guidelines for minimal training requirements among the 3 Societies a Consensus Conference on training in HPB surgery with representatives from the AHPBA, the Society of Surgical Oncology, and the

American Society of Transplant Surgeons took place in 2014 in an attempt to establish programmatic requirements, minimum case volumes and quality metrics.[6]

In the first part of our survey we attempt to identify the quality characteristics of the residents who match in FC-accredited HPB fellowship programs and the reasons they choose a specific fellowship and how they prepare for it. Borman et al. reports that over the course of the years more and more general surgery residents seek additional specialized training in the form of a fellowship.[7] This is further supported by the fact that frequently the graduates from general surgery residency programs are inadequately prepared to enter a fellowship or practice independently.[1] On the other hand Osman et al. support that residents who enter HPB fellowships specifically are adequately prepared,[2] something that is in concordance with our findings. In our survey all 15 fellows reported feeling somewhat or mostly prepared for their fellowship. They did so either by asking for more rotations in relevant services like Surg. Oncology, Transplant etc. or by performing HPB-focused research and attending HPB meetings. Additionally 4/15 (27%) fellows had already completed another fellowship such as abdominal transplant, MIS or surgical oncology prior to starting the HPB fellowship. Most current fellows have performed between 20 and 50 HPB cases during residency and 40% (6/15) of them have scrubbed in more than 50 cases, number which is significantly higher than the average national mean.[5] It is important to note that we found that most fellows who match in an HPB fellowship have no prior robotic experience (8/15 fellows) or have performed less than 10 robotic cases (5/15 fellows), something that is higher than expected and reported in literature[8] for general surgery graduates. This finding can be partially attributed to the fact that significant number of fellows had completed their residency in Canadian programs where the robotic experience is limited compared to US programs.

Analyzing why the fellows choose a specific program, we can safely conclude that case volume and variety are the most important factors that affect this decision, followed by the reputation of the institution (Fig. 2). Additionally most of the fellows (12/15) matched in their first choice revealing a good understanding of how the matching process works and a mutual feeling with the programs about where they would be a "good fit". Number of cases seems to be by far the most important factor both for choosing a fellowship and for feeling adequately trained at the end of the fellowship in order to feel confident and practice independently.

The second part of our survey is focused on identifying the specific expectations of the fellows regarding their training. It is well accepted that outcomes of complex surgeries such as esophageal and pancreatic resections are highly influenced by case volume and specifically for pancreatic resections the mortality can be as high as 16.3% if the surgeon performs less than one resection per year but drops to 3.8% when the surgeon performs more than 16 per year.[9] Tseng et al. reports that the learning curve is also very important in pancreatic surgery outcomes with the operative time, the blood loss, and the length of stay significantly improving after the surgeon has performed 60 cases.[10] These facts appear to be well understood by the participating fellows in our survey since the majority of them (12/15 − 80%) not only chose a fellowship based on case volume and variety but anticipate doing between 150 and 250 HPB cases, believing that 150 to 200 cases are enough for adequate training (Tables 1, 2).

With minimally invasive (laparoscopic and robotic) techniques becoming more and more common a part of this survey was dedicated to interviewing the fellows about their expectations in training in MIS techniques during their fellowship.

With MIS techniques becoming very prominent in many fields of surgery, there is a discussion about the role and future of MIS approaches in HPB surgery. Laparoscopic/Robotic distal pancreatectomy is now considered to be the standard of care[11] and robotic pancreaticoduodenectomy is established as a safe procedure with similar outcomes to open pancreaticoduodenectomy.[12,13] On the other hand, a learning curve exists there too and it actually appears to be longer compared to the open approaches.[14] The findings from our survey reflected these perceptions. Fourteen out of 15 surveyed fellows believe that MIS approaches will be more frequently utilized and 10/15 replied that being trained in robotic HPB surgery is extremely or somewhat important (Tables 3, 4). Interestingly only 8/15 (54%) of fellows will be trained in robotic approaches and only 3/15 (20%) responded that they will be able to apply MIS techniques for a variety of cases with the rest (12/15 − 80%) stating that they anticipate being able to perform only specific cases in an MIS way (Tables 5, 6). By analyzing the fellows' responses about the role of MIS in HPB surgery someone could conclude that there is a significant mismatch between what the fellows want from their training and believe is important and what they will actually get.

A very impressive finding in our survey is what the incoming fellows responded about the desired level of autonomy in the operating room. Interestingly 10/13 (77%) fellows responded that the attending should be performing the case the first few months with the fellow assisting (Table 7) something that reveals very low expectation for transition to more autonomy. This may be attributed to the high complexity of the operations, the belief that an intraoperative complication can be lethal in such patients and the feeling that a new fellow lacks the required skills and experience. For most

complex surgical specialties the "watch and learn" method is acceptable for the first few months but by the end of fellowship fellows should be expected to display complete autonomy with the ability to take someone through the case. Perhaps it would be helpful to have a system to measure that autonomy universally across all programs.

This is in contrast to the response to the question about when the fellows expect to be able to independently perform a complex open case such as a whipple where 9/15 responded in 1 to 3 months. On the other hand from the fellows that will be robotically trained the majority expect to be sitting in the operating console from the first 1 to 2 cases likely because they acknowledge that MIS cases are harder to learn.

Another important expectation described by the fellows at the beginning of their training is being productive in research. The majority (9/5) anticipate producing at least 1 to 2 publications during their fellowship and more than half (8/15) would like to have dedicated research rotations without clinical responsibilities especially in a 2-year program. This is further supported that the majority of fellows would seek an "academic" job after graduation from their fellowship. This is not surprising since the vast majority of HPB fellowships are in academic institutions with established research programs and faculty that are international leaders in HPB surgery. In regards to the optimal duration of the fellowship, it seems that most fellows consider 2 years with research rotations ideal which is similar to what Seshadri et al. reported when he performed a 20-question survey in active members of the AHPBA.[5] He reports that 68.1% of the practicing HPB surgeons and 77.3% of current fellows believe that 2 years fellowship is better than one year in terms of being adequately prepared.[5]

The final part of our survey reflects the expectations of the fellows regarding their post-training professional life. Thirteen out of 15 (87%) fellows want to practice in an academic setting and 11/15 (73%) believe that it is very likely to find an HPB job whereas the rest 27% do not anticipate finding a relevant position. Cho et al. distributed a survey in recently (2011-2015) HPB graduates and found that 46.7% of them accepted an academic job and 40% accepted a mix of private and academic affiliated job. Ninety percent of the graduates are still working on their first job but only 56.7% of them perform mostly HPB cases.[15]

CONCLUSION

Based on our survey we can report several conclusions. It is clear that the incoming fellows believe that the case volume in the most important factor for both choosing a fellowship and for being adequately trained. The majority anticipates having enough case numbers for adequate training and would accept helping the attending at the beginning of the fellowship rather than actually doing the case. MIS techniques are important to be taught, harder to learn but unfortunately significant percentage of fellows do not anticipate having adequate exposure to them something that represents a significant mismatch between fellows' expectations and actual training. The fellows anticipate being research productive during their training and will seek an academic related HPB job.

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SUPPLEMENTARY INFORMATION

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.jsurg.2019.06.009.