

Accelerated 2-day Training in Therapeutic Endoscopic Ultrasound (TEUS) with High-Fidelity Simulated Animal Models (HFSAM) . Satisfaction Survey, Cost and Benefits.

Leonardo SOSA-VALENCIA, Lee SWANSTRÖM, Fanélie WANERT, François HABERSETZER, Jerome HUPPERTZ, Juan VERDE, Alain GARCIA, Andrea SPOTA, Giovanni LARACCA, Takeshi URADE, Mariano GIMENEZ .

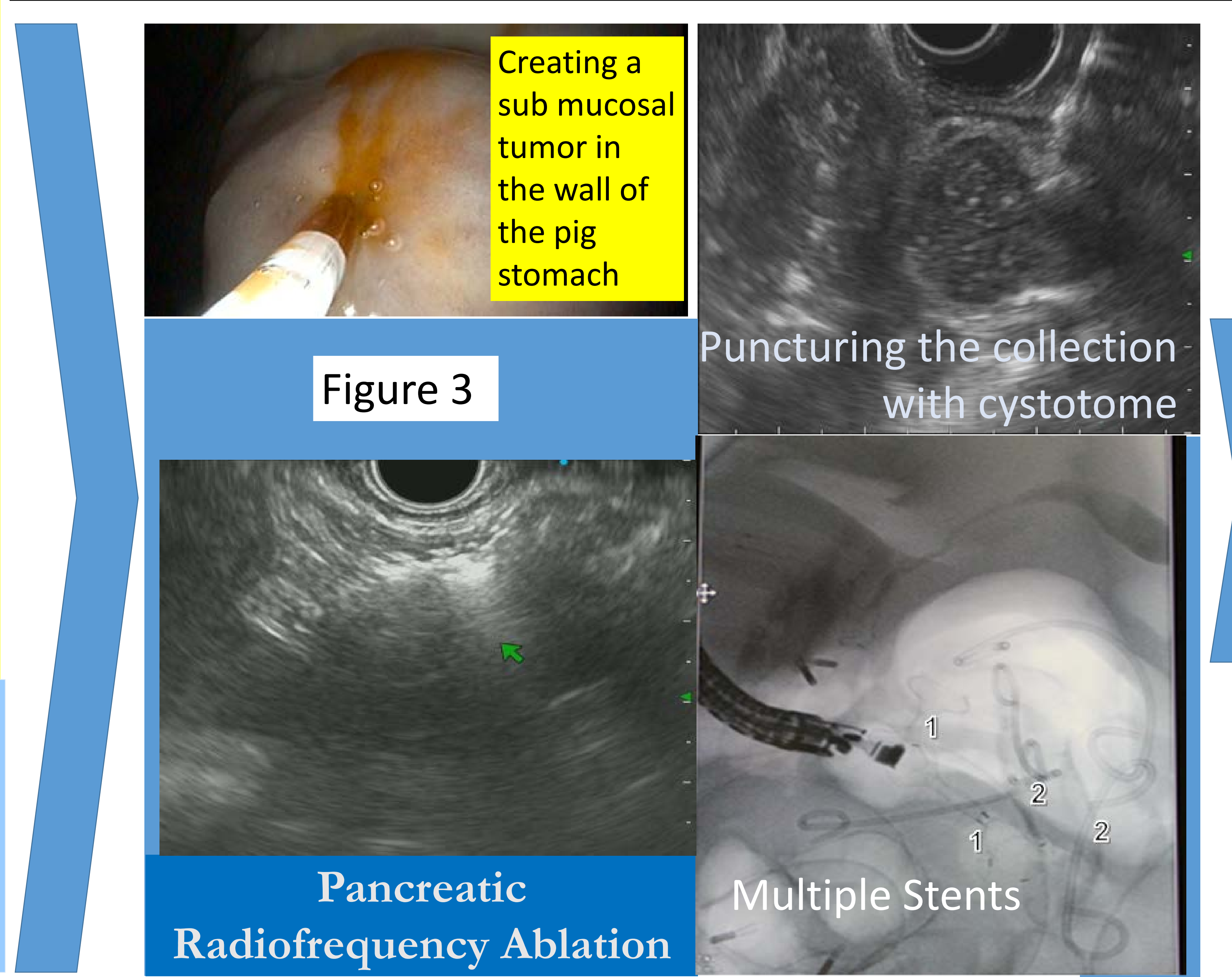
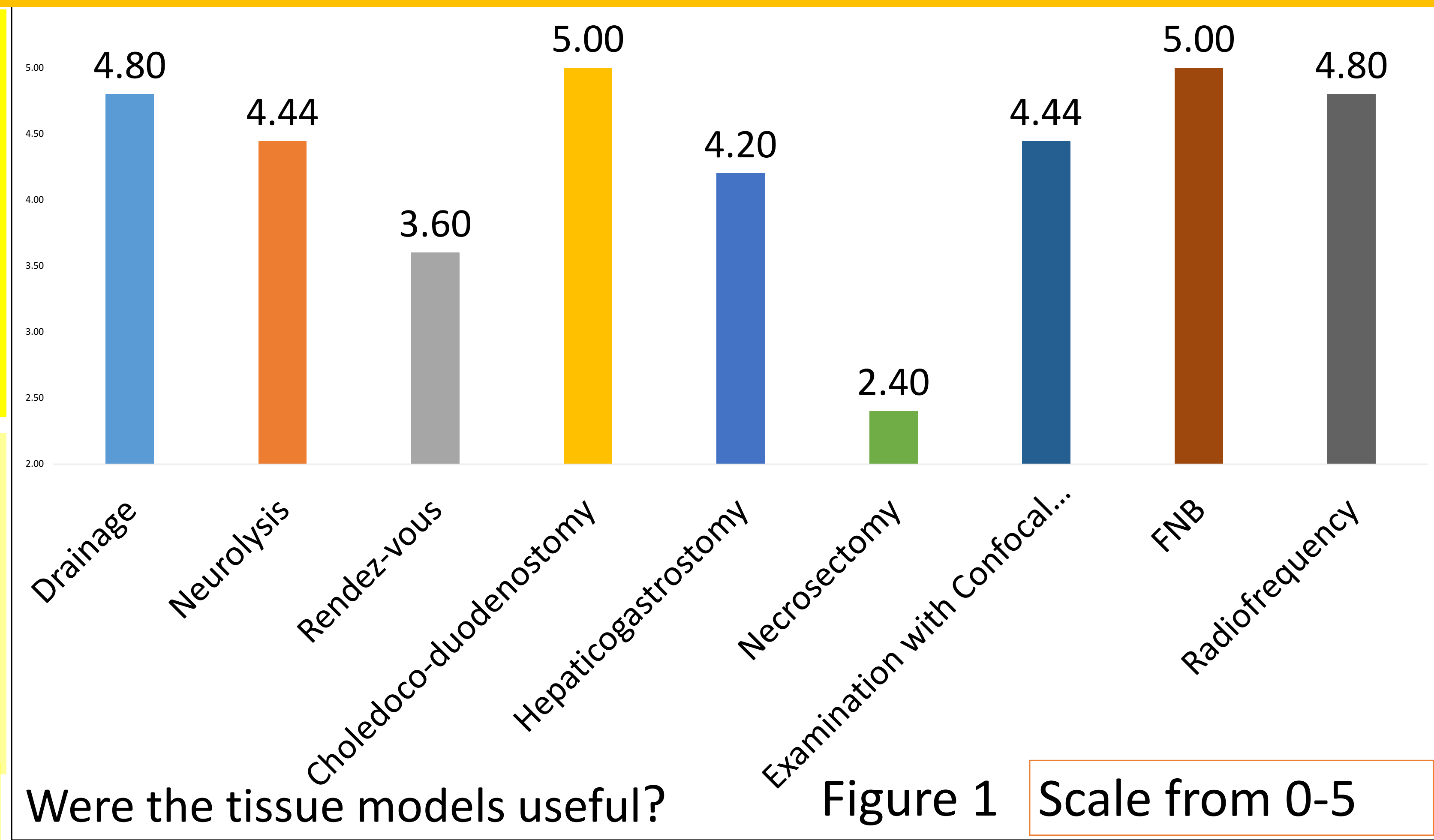
Institute of Image Guided Surgery-IHU, Strasbourg FRANCE.

Introduction: TEUS has a long learning curve and is costly. Simulators, ex-vivo models and phantoms are the current teaching methods used. Training with HFSAM is complex to set up and not standardized but is well received by students. The availability of expert mentors is expensive and not evident.

Objective: We have designed a training curriculum for TEUS that uses didactics and HFSAM. Trainees operate in paired groups per TEUS station to perform a large number of realistic procedures over 2 days with expert mentors.

Procedures: Four PENTAX-HITACHI stations were used. Multiple lesions of 3 different pathologies were created in 17 mini pigs to achieve the HFSAM. Ten trainees with seven expert proctors performed all TEUS procedures (TEUSP). There were 2 sessions each day of the 2-day course so each student practiced on 4 animals. A non-expert observer evaluated all TEUSP. Data included demographics, detailed procedures and Likert-Scale quality assessment, realism and education utility of the HFSAM. Experts and trainees used two scales (1-10 and 0-5). Two blinded program educators analysed all data.

Methodology: HFSAM were created using endoscopy and surgery: Sub mucosal tumors (SMT) with hydrogel injected gastric wall, retro gastric collections with 5-7cm long intestinal loops filled with oatmeal of varied colors and viscosities ,



Results and Evaluations	Interest of models	Useful techniques	Appreciation	Live, lectures, presentations	Recommendations	Satisfaction
Figure 2						
Participants	4,30	3,95	4,63	4,75	4,88	4,82
Experts	4,12	3,77	4,60	4,68	5,00	4,87

and bile duct and ureteral obstructions. SMT and lymph nodes served for FNB and radiofrequency. Retrogastric fluid collections and choledochal-ureteral obstructions served for: cystic/hepatic/choledochal/ gallbladder/ kidney drainage, fiducial, glue embolization, microbiopsy and nCLE. A total of 11 TEUSP were designed for each animal.

Results: Quality of HFSAM: 71% had an excellent rating (8-10), 24% good (7-4), and 5% poor (1-3). In eight of the TEUSP, the HFSAM were rated poor: sausages with high fat content, intestines not well- attached, normal pancreatic duct, inability to rendezvous due to clipped papilla and no gastrojejunal anastomosis. The trainees had an average experience of 5.86 years. 168 TEUSP were performed with a mean of 10.5 / day / station. According to experts/trainees, HFSAM were: Interesting 4.56, Satisfactory 4.84, Interactive 4.96, Recommended 4.91, Acceptance of the models 4.21, Useful techniques 3.86, Global appreciation 4.61(FIG 1-2). Twenty-one TEUSP per trainee as (principal or assistant) were performed (FIG 3). The cost for the course/expenses for one trainee was approximately 3200euros, or 152euros per procedure. Atypical 45day training program at a referral center is estimated at 7200euros for expenses, or around 342euros per TEUSP - not including the cost of not working for 41 days.

Conclusions: Our HFSAM was considered an excellent training tool by both experts and trainees. It may provide a better, faster, more cost-beneficial learning experience for TEUSP.