Society of American Gastrointestinal and Endoscopic Surgeons
Anual Meeting 2021, August 31 – Sept 3

LOW-COST INANIMATE MODEL TO SIMULATE A TAPP LAPAROSCOPIC INGUINAL HERNIA REPAIR.

Axel Sánchez MD Víctor Pinto Angulo MD** Hugo Enrique Estrada MD**
Jeziel Ordoñez MD Alfredo Olvera MD**
*General Surgery resident physician *** Surgeon physician of the General Surgery Department*
General Surgery Department. "Hospital Juárez de México"

Scan to watch the procedure on YT.

INTRODUCTION

Inguinal hernia repair is one of the most common procedures performed by general surgeons. Current trends in surgical areas cover simulation and allows to develop skills before carrying out a practice on a real patient.

We searched opportunity areas in simulation, identifying the possibility of creating an inanimate model for performing a right TAPP laparoscopic inguinal hernia repair.

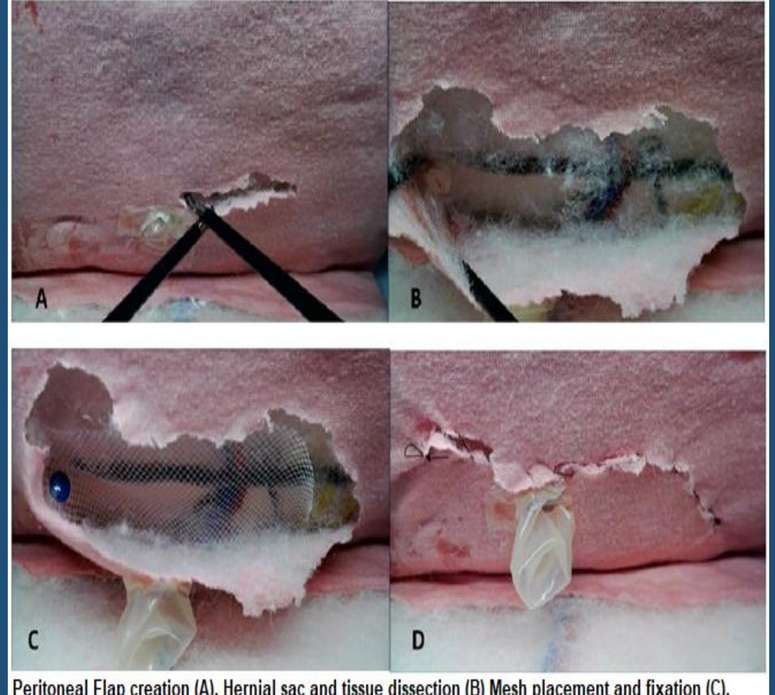
There are other models of this type made of other materials such as the one presented by Ruiz A.[1] and Nishihara[2]; however, we intend to present a new model as an alternative we consider low-cost and easily reproducible.

MATERIAL AND METHODS

We create a new simulation model of a TAPP laparoscopic right hernia repair, reproducible, with easily accessible materials. On YouTube® we presented a video in "Víctor Pinto Angulo" channel with the following link https://www.youtube.com/watch?v=U_XXHJz3sWA (QR code). In this video we present a step-by-step anatomic model which simulates the inguinal region with low-cost material that can be adequate to right or left inguinal hernia and can be reused multiple times.

Within Google Classroom®, 28 general surgery residents in a third level hospital reproduce this practice by creating a video, the videos were revised by the professor, identifying the main mistakes and difficulties during the practice. We applied a survey using Google Forms® focusing in four subjects: general data, previous experience, model feasibility and integration.

Figure 1. TAPP laparoscopic right hernia repair model.



Peritoneal Flap creation (A). Hernial sac and tissue dissection (B) Mesh placement and fixation (C). Peritoneal flap closure (D)

RESULTS

Respect feasibility 85.7% refer easy access to materials, 57.1% invested less than an hour creating the model, and 46.4% refers taking the same time in the practice.

Our model proves to be cost effective, 35.7% referred spending less than 100 Mexican pesos (5 USD). 42.9% thought the peritoneal flap closure was the most difficult step and 64.3% believes laparoscopic suture was the most developed skill. As a result, 85.7% considers this model improved their skills in a TAPP laparoscopic repair, while 96.4% would recommend the generalization of this model in general surgery courses.

Table 1. General data and previous experience

Age (years old)	28 (25-31)
Sex	
Male	21 (75)
Female	7 (25)
Academic grade	
1st	10 (35.7)
2nd	8 (25)
3rd	7 (28.6)
4th	3 (10.7)
Endotrainer use experience	
Yes	26 (92.9)
No	2 (7.1)
TAPP (procedures performed)	
1	18 (64.3)
2	5 (17.9)
3	4 (3.5)
>3	1 (14.3)

Results are shown in median (range) or n (%)
TAPP Transabdominal preperitoneal

Table 2. Most difficult procedure to perform

Peritoneal flap creation	1 (3.5)
Hernial sac and tissue dissection	8 (28.6)
Mesh placement and fixation	7 (25)
Peritoneal flap closure	12 (42.9)

Results are shown in n (%)

Table 3. Major skill developed

Endoscopic suture	18 (64.3)
Traction and countertraction	4 (14.3)
Tissue dissection	3 (10.7)
Fine needle adjustment	1 (3.6)
Cutting	2 (7.1)

Results are shown in n (%)

DISCUSSION

TAPP technique for inguinal hernia repair is safe and reproducible when is performed by trainee surgeons under supervision of laparoscopic surgery experts[3]. The continuous use of simulators like the one we propose is preferable for training before performing the procedure on a real patient. The creation of low-cost models is useful because it can be implemented in any General Surgery program. As shown below at table 3 there can be improvement in multiple skills necessaries for laparoscopic surgery training. Most of the residents who participated agreed that the model is useful for improving laparoscopic skills required in TAPP technique inguinal hernia repair.

CONCLUSION

We create a low-cost simulation model with accessible materials, and easily to reproduce for every student. We know that we need more prospective studies where results in a real patient can be evaluate before the practice with this model.

REFERENCES

1. Ruiz A, Cruz A, Barbosa F, Sosa A, et al. Mejora de la curva de aprendizaje en la hernioplastia inguinal laparoscópica tipo transabdominal (TAPP) con la utilización de un nuevo modelo de simulación. Rev Hispanoam Hernia. 2020;8(4):156-161.
2. Nishihara Y, Isobe Y, Kitagawa Y. Validation of newly developed physical laparoscopy simulator in transabdominal preperitoneal (TAPP) inguinal hernia repair. Surg Endosc. 2017;31(12):5429-35.
3. Bökeler U, Schwarz J, Bittner R, et al. Teaching and training in laparoscopic inguinal hernia repair (TAPP): impact of the learning curve on patient outcome. Surg Endosc. 2013;27(8):2886-93.