

Trainee Experience in Levels of Difficulties for Flaps in Plastic Surgery

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Abstract

Original Research Article

The competency-based medical education (CBME) approach has introduced medical curricula across the globe, designed to provide flexibility, Responsibility and learner-centredness for medical learners. While traditional surgical skills training in most places has relied on "see one, do one, teach one model", simulation model-based training has been shown to improve surgical interns skills. Safely performing local and regional flaps is often a challenge for surgical residents. Therefore, the aim of this study was to assess the difficulty classification of flaps and establish equivalence between them at each level. A questionnaire and an assessment of surgical skills were sent to all plastic surgery residents and young specialists in Morocco analyzing the theoretical and procedural knowledge of flaps. Skills are assessed using a modified version of an objective structured assessment of the Technical Skills Score.

Keywords: Flaps, plastic surgery, residency, training, simulation, trainee experience.

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INTRODUCTION

The competency-based medical education (CBME) approach has introduced medical curricula across the globe, designed to provide flexibility,

Responsibility and learner-centredness for medical learners. While traditional surgical skills training in most places has relied on "see one, do one, teach one model", simulation model-based training has been shown to improve surgical interns skills.

Safely performing local and regional flaps is often a challenge for surgical residents. Therefore, the aim of this study was to assess the difficulty classification of flaps and establish equivalence between them at each level.

PATIENT AND METHODS

An anonymous online questionnaire and an assessment of surgical skills were sent to all plastic surgery residents and young specialists in Morocco analyzing the theoretical and procedural knowledge of flaps. Skills are assessed using a modified version of an objective structured assessment of the Technical Skills Score. It's a prospective study between October and November 2022 and fifty resident and specialist answered the questionnaire.

RESULTS

1- Epidemiology

40% of the residents were under 30 years old and 60% were between 31 and 45 years old with the mean of 32 years old a minimum of 26 years old and maximum of 40 years old (Fig1). Sex ratio was 2.33 female / male (Fig.2)

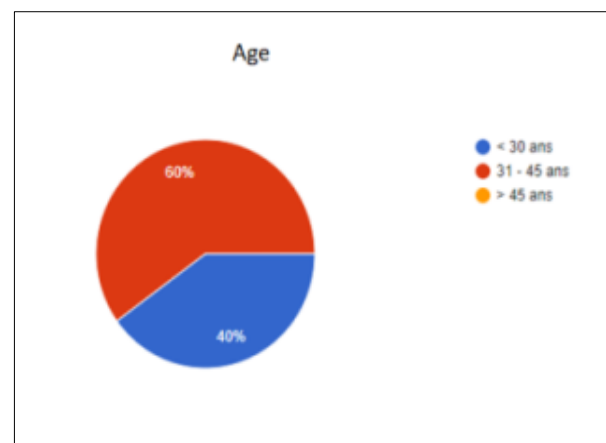


Figure 1: Age of the doctors

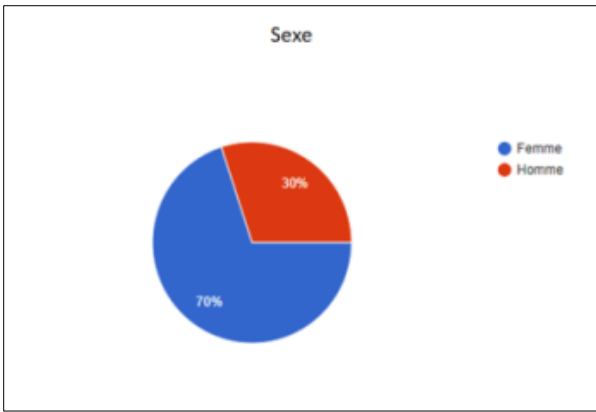


Figure 2: Sex of the doctors

Half of the specialist have less than 5 years of experience and the other half have between 5 and 10 years experience (Fig3).

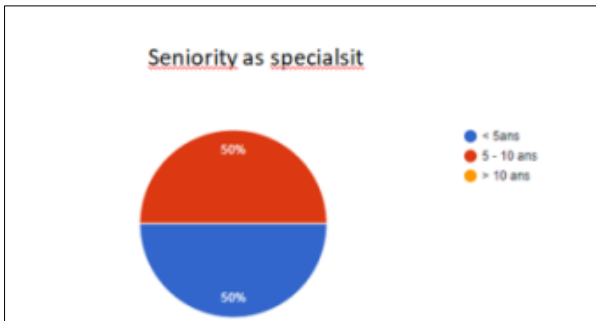


Figure 3: seniority as specialist

Meanwhile all year of residency were represented even professor and specialist (Fig4).

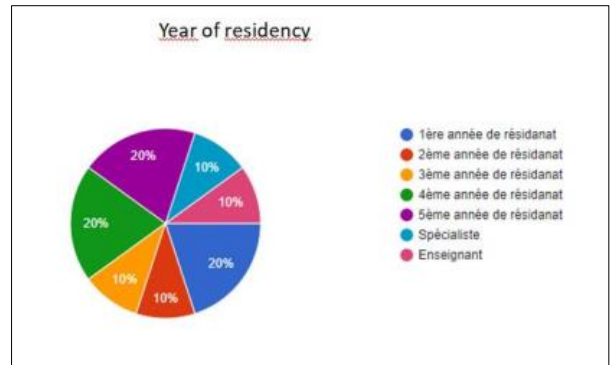


Figure 4: year of residency

For the specialist’s half of them are in university hospital and the other half work in liberal activity (Fig5).

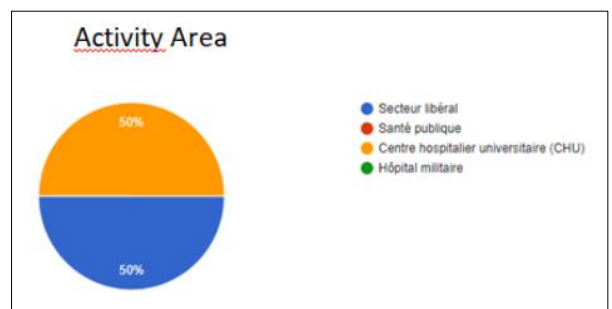


Figure 5: Activity Area

The main activities were burning treatment and tumoral followed by reconstructive surgery and at the end aesthetics (Fig 6).

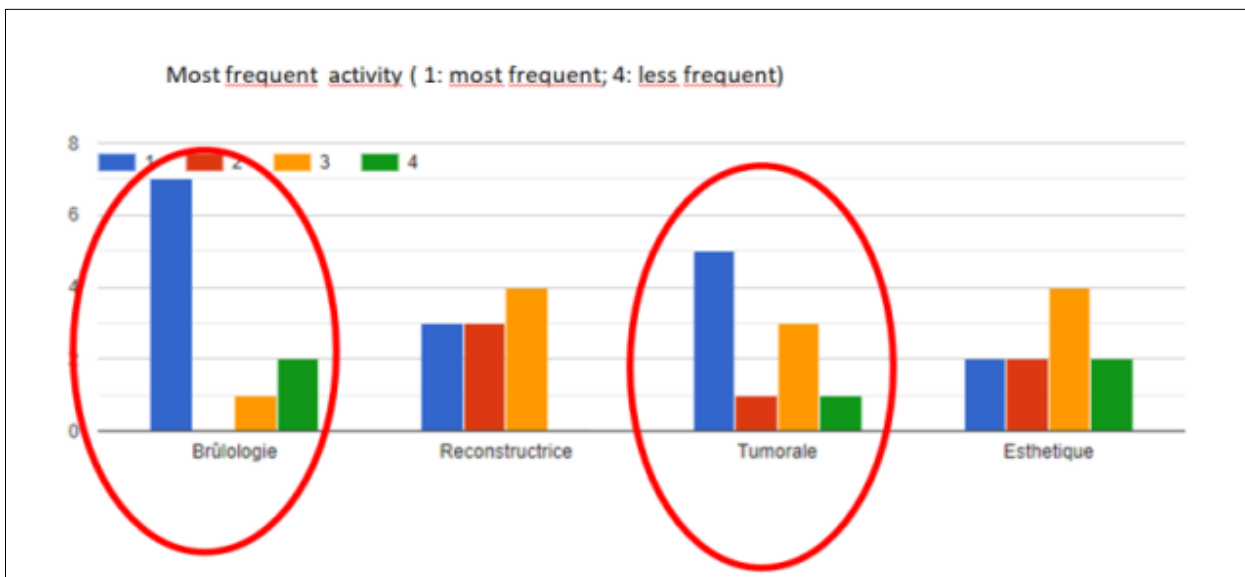


Figure 6: Most frequent activities

2- Local flaps

At the question in what year did you perform your first local flap without advisor no one did it in the

first year, 10 % in the second year and 50 % in the third year (Fig 7). The local flap was a Z plasty for half of them and for 20 % it was tridet Plasty (Fig 8).

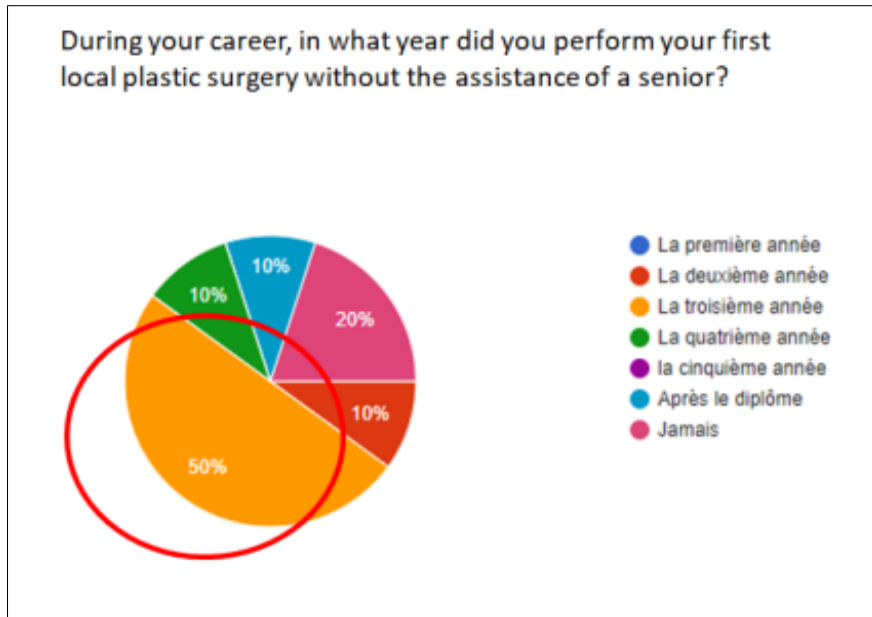


Figure 7: Which year the first local flap

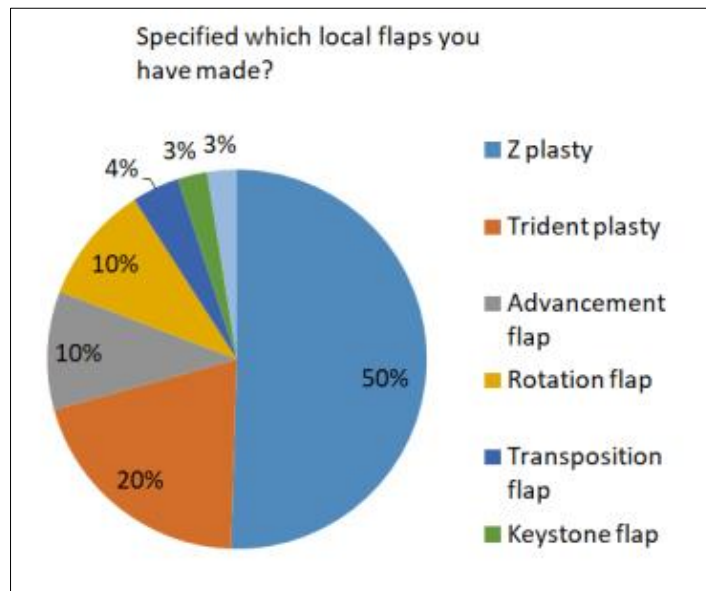


Figure 8: Which local flap?

We ask them to rank the local flap from the easiest one to the hard one (Fig9) and we conclude that

Z plasty is one of the easiest and VY plasty one of the most difficult (Table 1).

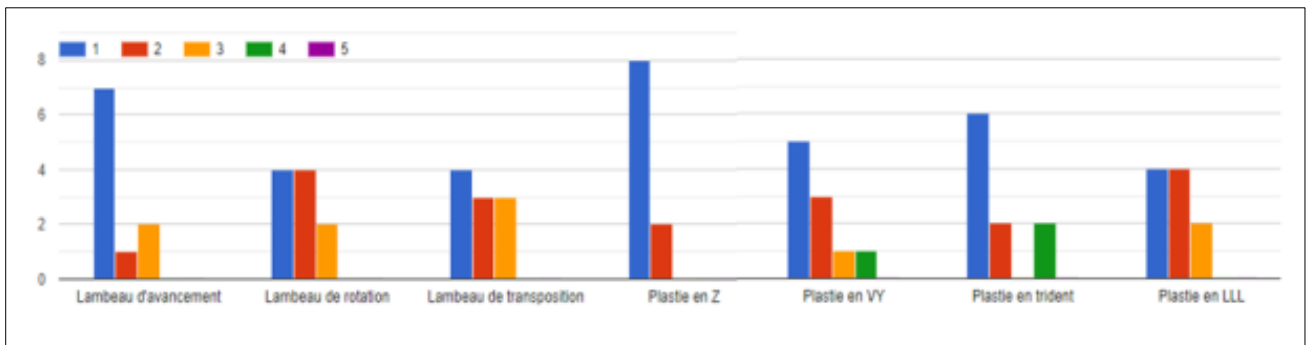


Figure 9: Ranking the flaps

Degree of difficulty	Flaps
1	Advancement flap; Z-plasty; Trident plasty
2	Rotation flap; Transposition flap; LLL plasty
3	VY-plasty;

Table 1: Degree of difficulty

3- Pedicle flap

To the question when was your first pedicle flap the main answer was never at 41 % followed by the

4th year 29 % and after graduation for 17% (Fig 10). The main type was neurosural flap for 65 % followed by fascia lata et temporalis flap 10 % each (Fig 11).

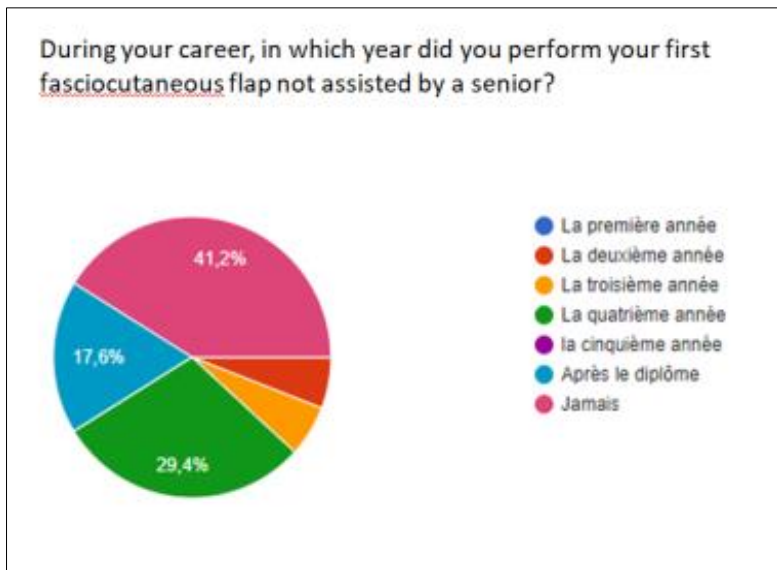


Figure 10: Pedicle flap Performed

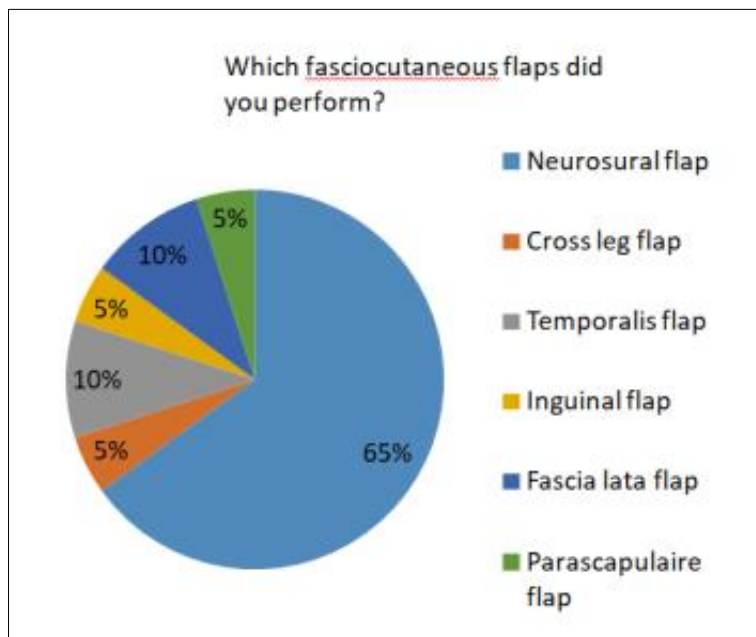


Figure 11: which flap was made

At the question which year did you perform your first muscle/musculo-cutaneous flap the answers are even more shocking 64 % never did it and only 20 % did

it while residency program (Fig12) and it was mainly latissimus dorsal flap for 50 % of the cases followed by pectoralis major flap at 35 % (Fig 13).

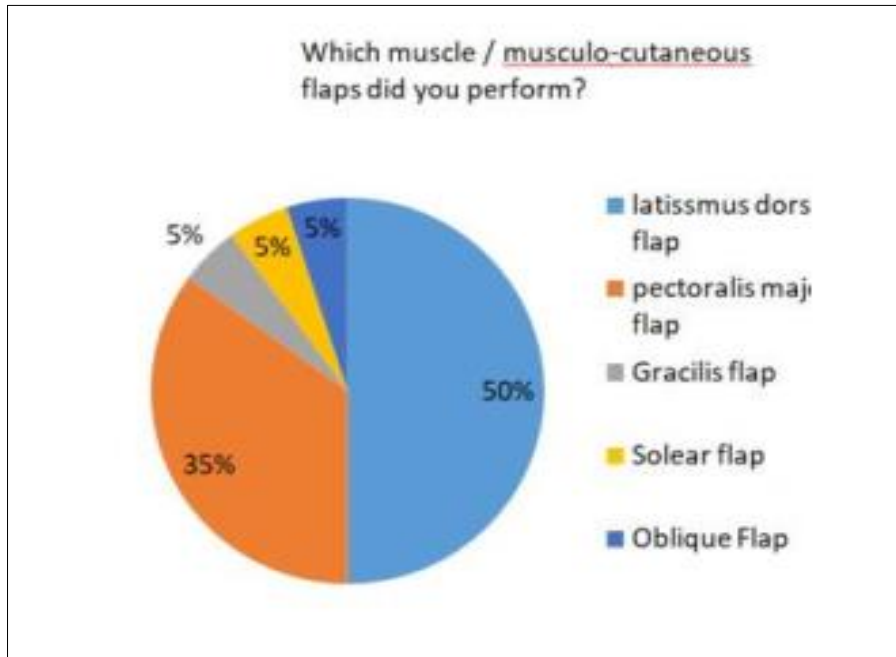


Figure 12: which flap you did?

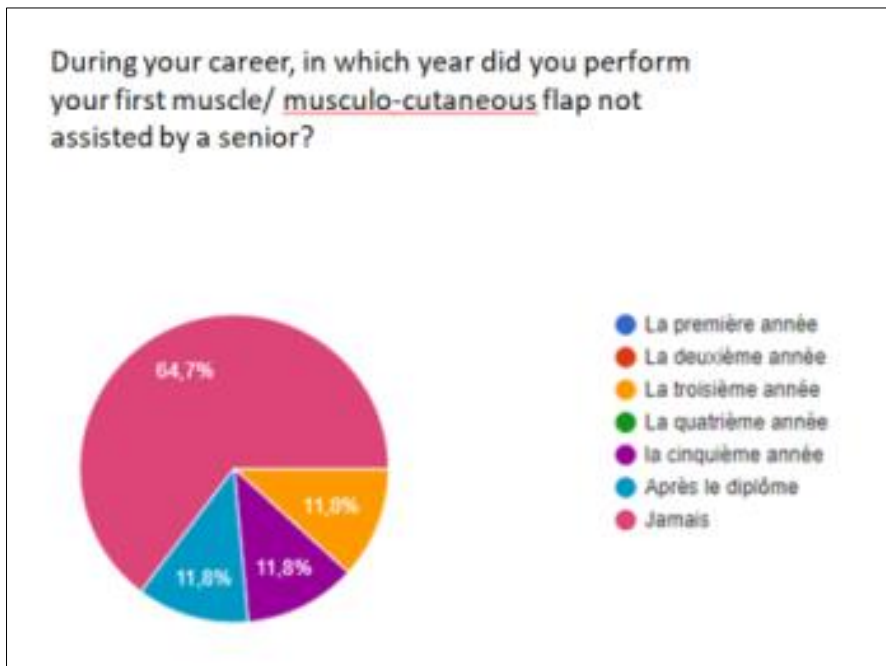


Figure 13: which year did you make your first muscle/ musculocutaneous flap

When we ask them to rank these flap the easiest one was the inguinal flap followed by neurosural flap and gracilis/ pectoralis major flap and lastly by latissimus

dorsi flap and gluteus maximum flap we rank them into four degree of difficulty (Table 2).

Degree of difficulty	Flaps
1	Inguinal flap;
2	Nasolabial flap; Gastrocnemius flap; Sural neurofascial skin flap; Posterolateral sural flap with proximal pedicle
3	Forehead flap; Temporal region flap; Pectoralis major flap; Scapular and parascapular flap; deltopectoral flap; rectus abdominis flap; Gracilis flap; Medial plantar flap; Tensor fascia lata flap
4	Latissimus dorsi flap; radial antebrachial flap; posterior interosseous flap; Gluteus maximus flap; Hamstring flap; Soleus flap

Table 2: Degree of difficulty of the pedicle flap

4- Free flaps

Unfortunately free flaps is not really developed only few professor have the ability to do it and none of those who were questionned made one.

5- Complications

All the doctors had to deal with complication the most frequent was suture loosening followed by infection, necrosis and hematoma (Fig 14).

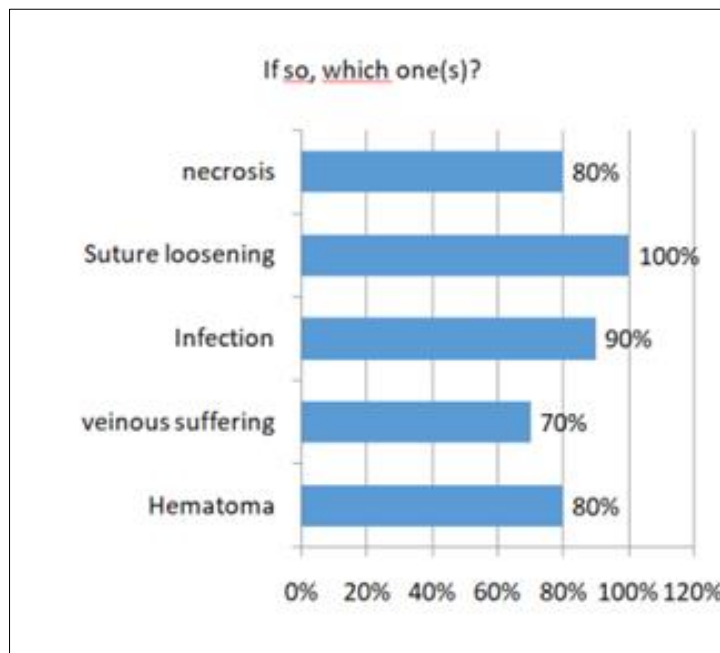


Figure 14: Complications

6- Satisfaction

The learning curve that the doctors had was satisfying for only 30 % of them (Fig 15) and 40 % were confident about their technique (Fig 16).

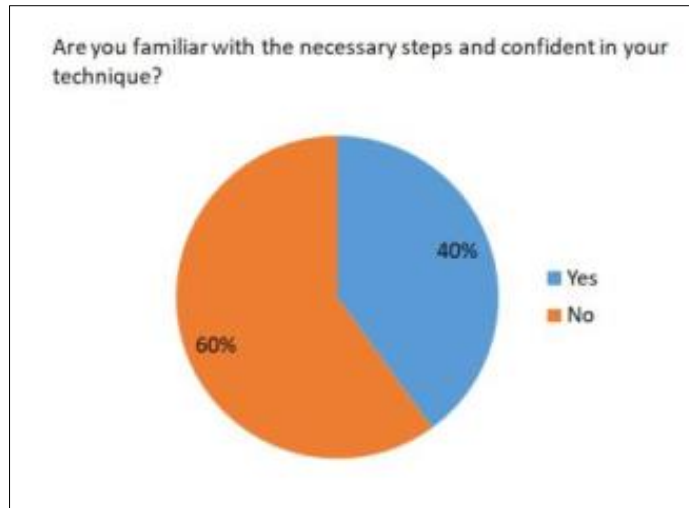


Figure 15: Technique confidence

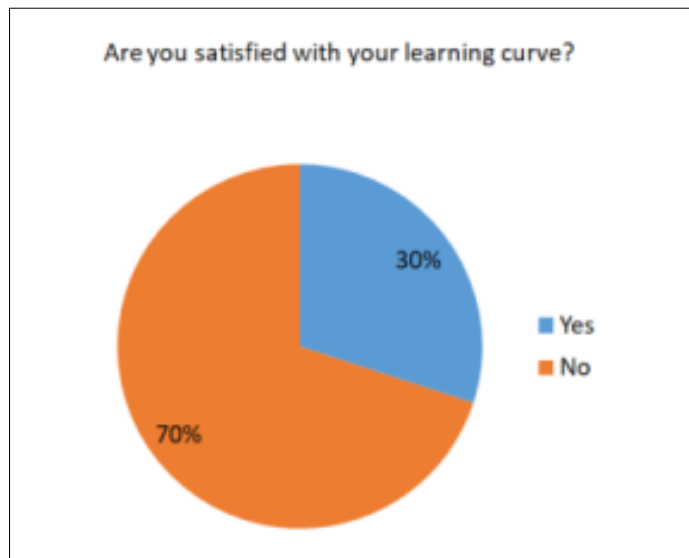


Figure 16: learning curve satisfaction

This confidence was able to be achieved after 3 to 5 flaps assisted by an advisor for 50 % of them, 30 % after two flaps and 20 % after more than 5 flaps (Fig 17),

and only 10 % think that they are able to lift any flap from the literature (Fig 18).

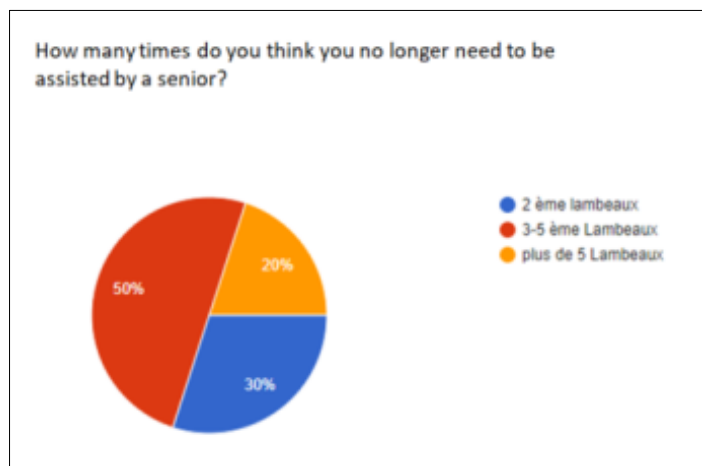


Figure 17: Number of flaps assisted by a senior

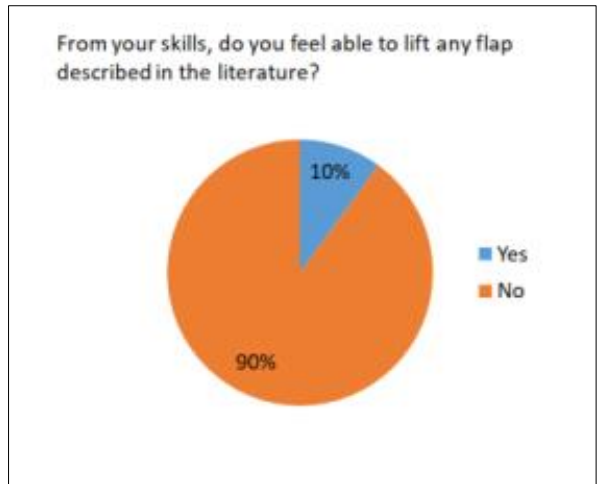


Figure 18: lift any flap of the literature

An additional training was possible for 40 % of them represented by microsurgery courses followed by

internship abroad and dissection and university degree (Fig 19).

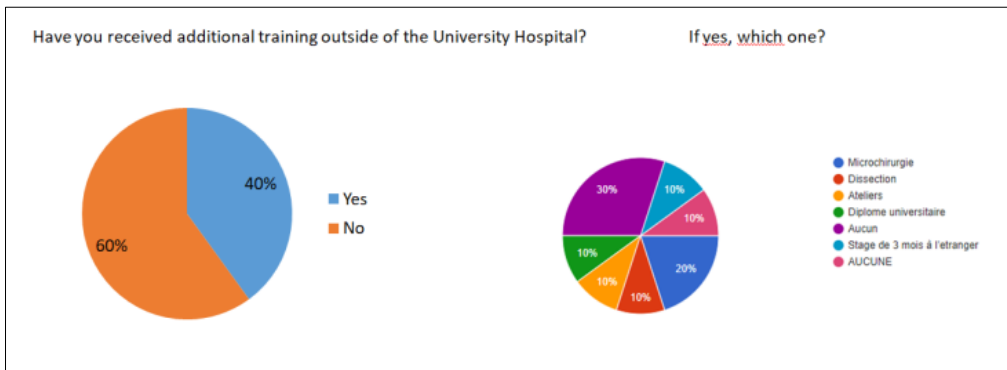


Figure 19: Additional Training

DISCUSSION

This 3-dimensional model using porcine skin effectively teaches local flap design and implementation in plastic surgery trainees, providing a close alternative to cadaveric dissection without the constraints and costs of human tissue [1]. Meanwhile The Institute of Surgery and Innovation Trunk Flap Dissection Course offers practical dissection and comprehensive feedback from experienced faculty, making it a valuable experience for trainees of all levels [2]. The 2-day Bob Huffstadt course offers a comprehensive overview of upper and lower limb flap dissection, developing operative and theoretical knowledge, and providing an excellent basis to develop reconstructive skills [3].

A simple, inexpensive method for practicing the design and execution of local flaps on excess tissue during breast reconstruction is described [4]. Postauricular region provides a safe environment for novice surgeons to practice theoretical and manual aspects of basic flap reconstruction [5]. Clinical experience and knowledge of basic principles and surgical skills are key before undertaking keystone flaps, such as the keystone perforator island flap [6].

Resident confidence improves with fresh tissue dissection (FTD), with greater gains seen in senior residents and higher confidence in radial forearm and latissimus flaps [7]. Resident involvement in plastic surgery is associated with increased overall morbidity, but not with increased odds of wound infection, graft, prosthesis, or flap failure, or overall mortality [8]. The local flap trainer, designed with a suture pad, is an effective teaching tool for plastic surgery residents and students, increasing their understanding and confidence in local flaps [9].

Hands-on training using bench models is a cost-effective method to practice surgical skills, especially in plastic surgery [10]. The one-day "hands-on" practical session significantly improved self-assessment confidence scores in all domains of plastic surgery, with suturing (58.6%) and skin lesion excision (74.5%) showing the largest improvement [11].

CONCLUSION

In conclusion, the complexity of performing all the flaps during the residency at this juncture is deemed insurmountable. However, this modest work serves as a crucial foundation by introducing a subjective

classification of flaps, fostering an equivalence of skills among them. Looking ahead, future perspectives hold promising avenues for advancement in this field. Possibilities include the exploration of cadaveric flap dissection, pursuit of an Interuniversity Diploma, and the integration of virtual reality with artificial intelligence, unlocking new dimensions in the comprehension and mastery of intricate surgical techniques. These innovative pathways underscore the ongoing commitment to enhancing surgical education and proficiency, paving the way for a more sophisticated and comprehensive approach to flap procedures.

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