



# Female genital aesthetic surgery: comparison of cadaver and live surgery training models

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## ABSTRACT

**Objective:** In this study, it was aimed to search the efficiency of fresh cadaver course and live surgical operations for female genital aesthetic surgery application.

**Materials and Methods:** Seventy-three obstetrics and gynecology specialists underwent a two-day course about genital cosmetic surgery that includes theoretical lectures, fresh cadavers and live surgeries. These surgeons divided into two groups. First group trained on cadavers (n=33), second group was involved in live surgeries (n=40). Skills in genital cosmetic surgery, applied procedures, number of participating colleagues in a procedure, ability to learn and motivations to take the course were compared before and after the training course. At the 6<sup>th</sup> month of education every trainee were called and interviewed about the progress they got after the education.

**Results:** After the fresh cadaver and live surgery training, numbers of trainees who performed genital cosmetic procedures (GCP) before the course and 6 months after the course were compared. A meaningful increase on numbers of trainees after the course who performed all GCP applications was observed. According to the statistics of participants, it was observed that a live surgical course is more beneficial than a cadaver course. Numbers of trainees who performed genital aesthetic surgery before and 6 months after the course were compared. A meaningful raise was observed in the statistics of trainees' numbers who performed all surgical applications apart from anterior and posterior compartment repair.

**Conclusion:** Fresh cadaver and live surgical courses have positive effects in the long term for the surgeons who have lack of surgical confidence and skills.

**Keywords:** Female genital aesthetic surgery; fresh cadaver courses; genital cosmetic procedures; live surgical courses

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## Introduction

Female genital cosmetic surgery (FGCS) includes procedures to augment reduce or reconstruct various anatomic structures in an attempt to cumulatively improve cosmetic appearance of external genitalia. Patient satisfaction could be achieved by reasonably preferring a combination of surgical and non-invasive procedures. Labioplasty application rates increased 44% in 2013 and is reported to be the fourth most common cosmetic surgical procedure in USA after liposuction, breast augmentation and rhinoplasty.<sup>1</sup> Admission of vulvoplasty rate in women without any medical necessity increased 140% in Australia between 2001 and 2013.<sup>2</sup> Most of the procedures performed without a medical necessity aims to improve vaginal laxity, sexual functions, sexual satisfaction of both partners and to alleviate discomfort in dressing or when participating in sports. FGCS, also known as vulvoplasty, describes a group of cosmetic surgical procedures applied without medical indications that change structure and appearance of healthy external genitalia.<sup>3</sup> These procedures could be more specifically described as labioplasty, hymenoplasty, vaginoplasty, mons pubis liposuction, labia majora lipid injection, vaginal “rejuvenation” or laser “rejuvenation”, G spot enhancement and orgasm-shot.<sup>3</sup>

There is growing interest and demand for female genital cosmetic applications in both patients and surgeons. Although surgical and non-invasive procedures of female genitalia fall under the field of gynecology, plastic surgeons and even dermatologists showing increasing interest to these procedures. Contemporarily, training for these cosmetic procedures in obstetrics and gynecology (obs/gyn) residency is far from being sufficient. Therefore, independent surgery workshops and training programs, specifically targeting female genital cosmetic procedures, has been developed. These training programs include anatomic models, virtual

reality video simulators, cadaver courses, practices on animal subjects, live surgeries besides theoretical lectures. In spite of the improvements in surgical training models, human cadaver remains to be gold standard in specific surgical training. Cadaver tissue provides unsurpassed surgical experience; therefore, it is crucial to increase the availability of cadavers.

This study aims to evaluate the effectiveness of fresh cadaver courses and live surgeries for FGCS training.

## MATERIALS AND METHODS

Seventy-three obs/gyn specialists underwent a two-day course about genital cosmetic surgery that includes theoretical lectures, fresh cadavers and live surgeries. These surgeons divided into two group. First group trained on cadavers (n=33); second group was involved in live surgeries (n=40). Skills in genital cosmetic surgery, applied procedures, number of participating colleagues in a procedure, ability to learn and motivations to take the course were compared before and after the training course.

At the 6<sup>th</sup> month of education every trainee were called and interviewed about the progress they got after the education.

## RESULTS

Mean age of trainees in Group 1 and Group 2 were 39.1±7.9 and 37.4±6.4 respectively. Group 1 includes 12 group two includes 30 women trainees. Mean working experience in Group 1 was 9.1±8.5 years and 7.2±5.9 years in Group 2. Number of monthly applied genital cosmetic examinations were found higher in Group 2 (7.3±9.1) and genital cosmetic surgeries were found higher in Group 1 (2.9±2.9). Motivations in taking the course, developing in practice and financial interests were similar between two groups, however concerns about malpractice was found higher in group 2 (6.9±2) (Table 1).

**Table 1. Distrubution of selective variable in the two groups**

Variable	Group 1 (cadaveric model group) (n=33)	Group 2 (live surgery model group) (n=40)	p-value
Age	39.1±±7.6	37.4±6.4±6.4	0.28
Gender (female; n, %)	12 (36%)	30 (75%)	0.001
Period of expertise (year)	9.1±8.5±8.5	7.2±±5.9	0.25
Genital aesthetic examination (in one month)	5.7±5.1±5.1	7.3±9.1±9.1	0.31
Genital aesthetic surgery (in one mount)	2.9±2.9±2.9	2.2±2.7±2.7	0.31
Course motivation reason of professional development (VAS)	9.1±1.5±1.5	9.1±1.4±1.4	0.82
Course motivation reason of earn money (VAS)	6.8±2.8±2.8	7.1±2.6±2.6	0.66
Course motivation reason of avoiding malpractice (VAS)	5.9±2.5±2.5	6.9±2±2	0.06

VAS: Visual Analogue Scale; n: number

Number of trainees applying genital cosmetic procedures (GCP) before and 6 months after the course were compared by questionnaire. Significantly higher number of trainees were found to perform all genital cosmetic procedures after the course. Number of trainees performing all types of genital cosmetic procedures before the course was lower in Group 2 in comparison to Group 1, however increase in number of surgeons performing all types of genital procedures after the course was greater in Group 2 (Table 2). Information obtained from participants revealed that live surgeries were more efficient than cadaver courses.

Number of trainees performing genital aesthetic surgeries (GAS) before and 6 months after the course were compared with questionnaires (Table 3). No significant difference was found in number of trainees performing genital aesthetic surgeries except labia major plasty and perinal body repair in Group 1. However, significantly increased number of trainees are found to perform all types of genital aesthetic surgeries except anterior and posterior compartment repairs in Group 2, 6 months after the course. Application of specific procedures was prominently increased 6 months after the course in Group 2. Increase in professional confidence in Group 2 trainees was reflected as growing number of procedures performed after the course.

Applicability of all types of GCP was found lower than applicability of all types of GAS procedures both before and after the course.

## DISCUSSION

Safely improving patient outcomes and providing high standards of training for colleagues are foremost components of professional ethics of a surgeon. Rapid technological advances in medicine permits surgeons to perform procedures on virtual models, cadavers or animal subjects and provide training for colleagues accordingly. This training models allow the trainee to

learn and practice surgical techniques step by step in a safe and comfortable environment, leads to an increase in professional confidence ensued by fewer mistakes. Moreover, simulations allow surgeons to accurately assess their surgical skills.<sup>4</sup> Enhanced reality focused training seems advantageous for both trainee and the instructor. Although cadaver practice is a traditional method, it still remains to be gold standard before attempting live surgeries. Practices on cadavers are of great importance before independently performing surgeries. Cadaver courses are approved training method in neurosurgery, plastic surgery, orthopedics, general surgery, urology, cardiovascular surgery and other fields to convey skills and information.<sup>5</sup> This is a unique study about applicability of FGCS and non-invasive procedures on fresh cadavers and live surgeries, involving transfer of knowledge and skills to trainees by professional instructors. Furthermore, our data indicate that training by live surgeries in accompany of an experienced team is more effective than cadaver courses.

Ahmed et al.<sup>6</sup> described a series of 81 urology residents that underwent surgical training course on cadavers. In their study they concluded human cadavers are the best simulation-based training models and provide supreme improvement in surgical skills that could be conducted to operating room. Sharma et al.<sup>7</sup> reported favorable effects of cadaver courses targeting specific procedures on improving surgical skills and professional confidence. Kim et al.<sup>8</sup> reported first applications of advanced surgeries in cadaver courses that improves anatomical knowledge and allows trainees to independently perform surgeries. Jansen et al.<sup>9</sup> showed the applicability of both basic and advanced procedures on cadavers and demonstrated the contribution of cadaver courses on comprehending specific procedures. Tasks of transferring skills and identifying new surgical technics could

**Table 2. Adaption and application of genital cosmetic prosedures in the two groups**

Variables	Group 1: Cadaveric model (n=33)			Group 2: Live surgery model (n=40)			p-values pre-course between groups	p-values post-course between groups
	Pre-course (n, %)	Post-course (n, %)	p-values within group	Pre-course (n, %)	Post-course (n, %)	p-values within group		
G-spot augmentasyon	2 (6.1)	12 (36)	0.006	1 (2.5)	20 (50)	<0.001 0.001	0.44	0.24
Hyaluronic acid vulvar rejuvenation	9 (27)	15 (45)	0.003	2 (5)	21 (52.5)	<0.001 0.001	0.008	0.54
Vulvar lipo-filling	6 (18.2)	12 (36.4)	0.03	1 (2.5)	10 (25)	0.004	0.02	0.29
Laser whitening	12 (36.4)	21 (63.6)	0.004	5 (12.5)	21 (52.5)	<0.001 0.001	0.01	0.33
Laser vaginal tightening	15 (45.5)	21 (63.6)	0.03	6 (15)	20 (50)	<0.001 0.001	0.004	0.24

n: number

**Table 3. Adaptation and application of cosmetic genital surgeries**

Variables	Cadaveric model (n=33)			Live surgery model (n=40)			p-values pre-course between groups	p-values post-course between groups
	Pre-course (n, %)	Post-course (n, %)	p-values within group	Pre-course (n, %)	Post-course (n, %)	p-values within group		
<b>Labia minora reduction</b>	30 (90.9)	33 (100)	0.9	27 (67.5)	33 (82.5)	0.03	0.01	0.01
<b>Labia majora plasty</b>	15 (45.5)	24 (72.7)	0.004	4 (10)	22 (55)	<0.001 0.001	0.001	0.11
<b>Hudoplasty</b>	15 (45.5)	15 (45.5)	1	7 (17.5)	20 (50)	<0.001 0.001	0.01	0.69
<b>Surgical vaginal tightening</b>	33 (100)	33 (100)	1	27 (67.5)	33 (82.5)	0.03	<0.001	0.01
<b>Episiotomy scar revision</b>	30 (90)	33 (100)	0.9	23 (57.5)	33 (82.5)	0.006	0.001	0.29
<b>Perineal body repair</b>	18 (54.5)	24 (72.7)	0.03	14 (35)	22 (55)	0.008	0.09	0.11
<b>Anterior compartment repair</b>	33 (100)	33 (100)	1	40 (100)	40 (100)	1	1	1
<b>Posterior compartment repair</b>	33 (100)	33 (100)	1	40 (100)	40 (100)	1	1	1

n: number

be accomplished by using cadavers. Many advances in female genital cosmetic surgery were transferred to trainees in this course. A noteworthy result of our study shows trainees in both groups were performing basic procedures like anterior and posterior compartment repair before the course however application of specific procedures like labia major plasty, clitoral hood plasty and perineal body repair increases over 50% after the course. This showed cadaver courses and more importantly live surgeries are effective in improving surgical skills besides indicating the lack of experience involving FGCS gained in residency trainings of obs/gyn specialists. Therefore, showed that cadaver courses and live surgeries accompanied by experienced instructors should be incorporated into regular residency training.

One of the basic issues that a surgeon should learn is management of complications. Cadaver courses could imitate complications by simulations and allows trainee to gain experience and improve skills safely. Mismanagement of any possible complications in genital cosmetic surgery may lead a surgeon to lose his confidence ensuing avoidance of performing surgeries of similar types. In our courses, possible complications and their managements were explained to trainees on cadaver courses that increased their professional confidence. Multidisciplinary participation in live surgeries and exclusive training also contributed to increased awareness of complications in trainees.

Practical cadaver courses should be incorporated into residency and post-residency educations to obtain surgical skills experience and professional confidence before applying procedures on real patients. Anastakis et al.<sup>10</sup> described cadaver models as gold standard for technical skills training. Cadaver model provides a safe environment to trainees to make mistakes and practice procedures. Cadaver courses could be useful for a wide spectrum of surgeons from a junior resident to an experienced surgeon that practices new techniques. In this study we evaluated surgical skills of trainees before and 6-month after the course, besides the effects of cadaver training models and live surgeries on training of female genital cosmetic procedures. We have the opportunity to demonstrate that our course increased professional confidence of trainees. Questionnaires indicated an increase in trainees' professional confidence and surgical skills by showing an increase in number of procedures performed 6 months after course.

Growing demand and popularity of FGCS warrants incorporation of surgical and non-invasive genital cosmetic procedures into routine residency training. In addition to this we expect fresh cadaver and live surgery courses to have favorable long-term effects on professional confidence and surgical skills of surgeons without adequate training and experience in genital cosmetic surgery.

## ETHICS

**Ethics Committee Approval:** Since this is a cadaver study, approval by an ethics committee was not required.

**Informed Consent:** Informed consents were obtained from each patient.

**Peer-review:** Externally peer-reviewed.

## Contributions

Concept: B.A., Y.C., A.E.K., E.Ç.; Desgin: B.A., Y.C., A.E.K., E.Ç.; Data Collection and/or Processing: Y.C.; Analysis and/or Interpretation: A.E.K.; Project Development: E.Ç.; Writing: B.A., E.Ç.

## DISCLOSURES

**Conflict of Interest:** No conflict of interest was declared by the authors.

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