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Hymenoplasty Experience: Factors Associated with Dehiscence (Hymenoplasty Complications)

Erhan Huseyin Comert[1], Emre Kole[2], Ömer Sarac[3], Ozan Dogan[4], Eray Caliskan[5]

[1] Department of Obstetrics and Gynecology, Private Practice, Istanbul, Türkiye
[2] Department of Obstetrics and Gynecology, Alanya Alaaddin Keykubat University School of Medicine, Antalya, Türkiye
[3] Department of Obstetrics and Gynecology, Kocaeli City Hospital, Kocaeli, Türkiye
[4] Department of Obstetrics and Gynecology, Istanbul Nisantasi Universty, Istanbul, Türkiye
[5] Department of Obstetrics and Gynecology, Okan University School of Medicine, Istanbul, Türkiye

Erhan Huseyin COMERT
0000-0003-1431-2294
Emre KOLE
0000-0002-4940-8862
Ömer SARAC
0000-0002-9397-428X
Ozan DOGAN
0000-0002-0016-8749
Eray CALISKAN
0000-0002-6799-5909

Correspondence: Erhan Huseyin Comert
Department of Obstetrics and Gynecology, Private Practice, Istanbul, Türkiye
Phone: +90 544 373 74 26
E-mail: erhan.comert@hotmail.com

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ABSTRACT

Purpose: To evaluate outcome of hymenoplasties in private clinics and investigate the factors affecting the risk of dehiscence

Method: A retrospective cross-sectional survey of Obstetrics and Gynecology specialists trained over the last five years was conducted. Specialists from private clinics completed surveys on hymenoplasties performed. Rates and types of complications were requested and factors associated with wound dehiscence in patients undergoing permanent hymenoplasty was investigated with multivariate analysis.

Results:. A total of 968 patients were included. Hymenoplasty was performed for revirgination in 874 cases (90.2%), incision of the hymen for gynecological procedures in 82 (8.4%) cases and trauma in 12 cases (1.2%). Complications included wound dehiscence (26.1%), infection (1.7%), bleeding (1.7%), pain (1.5%), itching (1.4%) and dyspareunia (0.5%). The technique was permanent in 714 cases and temporary in 254 cases. Among the permanent hymenoplaty cases, multivariate logistic regression analysis showed that obesity (OR=3.1, 95%CI: 1.5-6.2, p=0.001) and tobacco use (OR=2.2, 95%CI: 1.3-3.8, p=0.003) increases the risk of dehiscence. Sedation decreased the risk of dehiscence when compared to local infiltration anesthesia (OR=0.56, 95%CI: 0.33-0.99, p=0.04). Every decrease in the polyglactin suture caliber decreased the risk of dehiscence (OR=0.22, 95%CI: 0.16-0.3, p<0.001)

This study showed that using 5.0 sutures, omitting infiltration anesthesia, and avoiding tobacco use may help decrease wound dehiscence after hymenoplasty.

Keywords: Hymenoplasty, wound dehiscence, complications, suture, surgical technique, infiltration anesthesia

ÖZET

Amaç: Bu çalışmada, özel kliniklerde gerçekleştirilen himenoplasti operasyonlarının sonuçlarını değerlendirmek ve dehisens (yarada açılma) riskini etkileyen faktörleri araştırmak amaçlanmıştır.

Yöntem: Son beş yıl içinde eğitim almış Kadın Hastalıkları ve Doğum uzmanlarına yönelik geriye dönük, kesitsel bir anket çalışması yapıldı. Özel kliniklerde çalışan uzmanlardan, gerçekleştirdikleri himenoplasti operasyonlarına ilişkin veriler toplandı. Komplikasyon oranları ve türleri sorgulandı, ayrıca kalıcı himenoplasti yapılan hastalarda yara dehisensi ile ilişkili faktörler çok değişkenli analiz ile değerlendirildi.

Bulgular: Çalışmaya toplam 968 hasta dahil edildi. Himenoplasti, 874 vakada (%90,2) bekâretin yeniden kazanılması amacıyla, 82 vakada (%8,4) jinekolojik işlemler için himen insizyonu nedeniyle ve 12 vakada (%1,2) travma sonrası gerçekleştirildi. Komplikasyonlar arasında yara dehisensi (%26,1), enfeksiyon (%1,7), kanama (%1,7), ağrı (%1,5), kaşıntı (%1,4) ve disparoni (%0,5) yer aldı. Operasyon tekniği 714 vakada kalıcı, 254 vakada geçici olarak uygulandı. Kalıcı himenoplasti vakalarında yapılan çok değişkenli lojistik regresyon analizine göre obezite (OR=3,1, %95 GA: 1,5-6,2, p=0,001) ve tütün kullanımı (OR=2,2, %95 GA: 1,3-3,8, p=0,003) yara dehisensi riskini artırmaktadır. Sedasyon uygulaması, lokal infiltrasyon anestezisine kıyasla dehisens riskini azaltmaktadır (OR=0,56, %95 GA: 0,33-0,99, p=0,04). Kullanılan poliglaktin sütür kalınlığının azalması, dehisens riskini her seviyede düşürmüştür (OR=0,22, %95 GA: 0,16-0,3, p<0,001).

Bu çalışma, 5.0 sütür kullanımının, infiltrasyon anestezisinden kaçınmanın ve tütün kullanımının önlenmesinin, himenoplasti sonrası yara dehisensi riskini azaltmaya yardımcı olabileceğini göstermektedir.

Anahtar Kelimeler: Himenoplasti, yara dehisensi, komplikasyonlar, sütür, cerrahi teknik, infiltrasyon anestezisi

Hymenoplasty may be performed to repair the hymen after injury or for cosmetic reasons. Although hymen aesthetics is legal in many countries, it remains ethically and culturally controversial and is performed as part of gynecology or plastic surgery (1,2). There was a dearth of research into hymenoplasty application techniques and management of complications in the literature. Hymenoplasty, unlike other gynecologic surgeries, involves ethical and psychological debates. The procedure aims to restore or narrow the vaginal opening (3).Furthermore, recent studies have shown that, despite the increasing popularity of hymenoplasty procedures, many clinicians lack adequate training in the techniques (4, 5).

The hymen is a thin and elastic membrane that partially covers the vaginal opening (6). If the hymenal opening measures 1 cm or less in diameter, the hymen is considered intact (7,8). The most frequently genesis type of hymen is the annular configuration, as was found in the present study (9,10). Penetrating hymen trauma, such as sexual intercourse, tampon use, or surgery, can cause deep clefts in the hymen and disrupt its integrity (11,12).

In the present study, which we intend will help fill the evidence gap, approaches to hymenoplasty, application techniques, and complications experienced by obstetricians who have an interest in cosmetic gynecology in Turkey were investigated. Moreover, clinicians' approaches to complications were evaluated.

Materials and Methods

In this cross-sectional, retrospective study, patients who underwent surgery for hymenoplasty procedures for reasons including revirgination, iatrogenic sectioning of the hymen for oocyte freezing, vaginal or uterine surgeries or biopsies, vaginal or hymenal trauma were reviewed. Data were collected by individual interviews with 41 expert clinicians from different private clinics. The data were collected by requesting the clinicians to complete a proforma datasheet for each patient. In the datasheet, information about the presence and nature of complications, concomitant surgeries or revision surgeries were included. The surgeons who performed these procedures were also questioned about their training and surgical experience. Ethical approval was obtained from the local ethics committee.

Patients were eligible for inclusion if of reproductive age (18-50 years). The demographic data, history of chronic diseases, smoking history, body mass index (BMI), surgical history, medication history, type of hymen, and additional surgical procedures performed during hymenoplasty were recorded on the datasheet.

Furthermore, information about the anesthesia method used during the surgery, suture material used, energy modality used, and the postoperative period was also included. Finally, respondents were asked about complications, if any, after hymenoplasty and/or additional surgery and treatment, and if so, what the nature of the complications were and whether any revision was performed.

Statistical analysis of the data was conducted using SPSS, version 21 (IBM Inc., Armonk, NY, USA). Continuous variables are presented as mean and standard deviation. Categorical variables are presented as numbers and percentages. Chi-square test was used to compare the distribution of categoric variables concerning the occurrence of dehiscence. Logistic regression analysis using the enter method was used to predict the occurence of suture dehiscence among the permanent hymenoplasty cases.

Results

A total of 54 experts from different private clinics that had hands-on education with hymenoplasty since 2015 were contacted and 41 (75.9%) agreed to participate. The surgeons reported that they performed a total of 1171 hymenoplasties in the last five years and the records of 1009 (86.2%) patients were available. Of these, 968 data sheets were fully completed and so constituted the study data pool, resulting in data available on 82.7% of all hymenoplasties performed.

The mean age of the respondents was 40.6±6.5 years, and the duration of their expertise ranged from 1 to 24 years. The respondents had been performing hymenoplasty surgeries for a mean of 3.4±3 years, ranging from 1 to 15 years. Hymenoplasty was performed for revirgination in 874 cases (90.2%), incision of the hymen for gynecological procedures in 82 (8.4%) cases and trauma in 12 cases (1.2%).

Demographic characteristics of patients are shown in Table 1. The Goodman technique(permanent) was used in

83.7% cases and the Flap technique(temporary) in 16.3%. Out of a total of 968 cases, 253 cases (26.1%) required revision within one to three months of the initial surgery due to wound dehiscence during postoperative follow-up.

Table 1: Selected demographic and operative variables of hymenoplasty cases.

Variables		Mean	(min-max)
Age (year)		28.7±4.3	21-46
Hymen Type		n (968)	%
	Annular	563	58.2
	Crescentic	339	35.0
	Septate	23	2.4
	Cribriform and others	43	4.4
Hymenoplasty Technique			
	Temporary	254	26.2
	Permanent	714	73.8
Tobacco use			
	Yes	392	40.5
Diabetus Mellitus			
	Yes	23	2.4
Obesity (BMI>30 kg/m^2)			
	Yes	138	14.3
Anesthesia Technique			
	Local anesthesia	586	60.5
	Sedation	382	39.5
Sutures used (polyglactin)			
	2.00	115	11.9
	3.00	299	30.9
	4.00	391	40.4
	5.00	163	16.8

Complications were observed in 68 (7%) cases, with wound dehiscence being the most common. Details are provided in Table 2. Other complications included bleeding, infection, pain, itching and dyspareunia.

Table 2: Complications of hymenoplasty.

Complications	n	%
Wound dehiscence	253	26.1
Other complications	68	7
Infections	17	1.7
Bleeding	17	1.7
Pain	15	1.5
Itching	14	1.4
Dyspareunia	5	0.5

The distribution of selected variables according to the presence of hymenoplasty dehiscence is presented in Table 3. Multivariate logistic regression analysis showed that obesity (OR=3.1, 95%CI: 1.5-6.2, p=0.001) and tobacco use (OR=2.2, 95%CI: 1.3-3.8, p=0.003) increased the risk of dehiscence. Sedation decreased the risk of dehiscence when compared to local infiltration anesthesia (OR=0.56, 95%CI: 0.33-0.99, p=0.04). Every unit decrease in the polyglactin suture caliber decreased the risk of dehiscence (OR=0.22, 95%CI: 0.16-0.3, p<0.001).

Table 3: Distribution of selected variables according to presence of dehiscence after permenant hymenoplasty.

Variable	Dehiscence (n=253) n (%)	Successful Healing (n=461) n (%)	P-value
Hymen Type			
Annular	122 (48.2)	371 (80.5)	<0.001
Crescentic	119 (47)	49 (10.6)	
Septate	12 (4.7)	11 (2.4)	
Cribriform and others	0 (0)	30 (6.5)	
Tobacco use	159 (62.8)	98 (21.3)	<0.001
Diabetes Mellitus	12 (4.7)	5 (1.1)	0.002
Obesity (BMI>30)	64 (25.3)	20 (4.3)	<0.001
Hymenoplasty technique			
Goodman	189 (74.7)	386 (83.7)	0.004
Flep	64 (25.3)	75 (16.3)	
Polyglactin Suture			
2.0	99 (39.1)	14 (3)	<0.001
3.0	117 (46.2)	82 (17.8)	
4.0	24 (9.5)	265 (57.5)	
5.0	13 (5.1)	100 (21.7)	
Anesthesia			
Local infiltration	211 (83.4)	171 (37.1)	<0.001
Sedation	42 (16.6)	290 (62.9)	

Discussion

The present study has assessed data from a large case series of hymenoplasty, including practitioners' experience and techniques, suture materials, complications encountered, and comorbidities. Significant variables were identified that were risk factors for the occurrence of possible complications. In this report, clinicians' approaches are revealed and both technical and training deficiencies are emphasized.

Following hymenoplasty, complications were observed in 68 (7%) of cases in the present study, with wound dehiscence being the most common. Some minor complications occurred, including bleeding, infection, pain, itching, and dyspareunia. Most authors have reported only minor complications. There are a few studies that have reported complications including wound dehiscence, discharge problems, stinging and mild pain, and postoperative itching (13–17). Although complications have been reported previously, no cause-effect relationship has been found for these complications.

Multivariate logistic regression analysis found that obesity significantly increased the risk (OR=3.1) of separation in our study. Adipocytes tend to expand in size under obese conditions. However, the vasculature does not increase proportionally, causing a delay in the rate of angiogenesis. Consequently, tissue experiences hypoxia due to insufficient blood supply due to inadequate vasculature. The resulting hypoxia may damage capillaries in the incision area, which increases the risk of infection and wound site dehiscence (18–20). Moreover, hypoxic wounds impair the synthesis of collagen, leading to defective healing (21,22). Vascular defects are also associated with defective or delayed recruitment of immune system cells to the wound (23), longer inflammatory responses and decreased secretion of mediators. Nutritional defects and micro- and macro-nutrients deficiencies in obese individuals also delay the healing process (24,25). Obesity has been associated with a greater general risk of surgical site infections (26) due to delay in wound healing, which promotes the entrance and proliferation of microorganisms.

Performing multivariate logistic regression analysis, we found that tobacco use increased the risk of opening (OR=2.2), similarly to obesity. Nicotine impairs proper macrophage migration and fibroblast activation, again impeding the wound healing process and also has a vasoconstrictive effect, leading to reduced wound perfusion(27).

According to our data, the dehiscence rate was higher in cases where local infiltration was used compared to sedation. We believe that high concentrations of local anesthetic can negatively affect wound healing and reduce collagen synthesis. Earlier studies have shown delayed wound healing associated with local anesthetic agents (28–30). In the present study, the dehiscence rate was significantly higher in cases where local anesthesia was preferred compared to general anesthesia. Although there are few publications, in labiaplasty cases where general anesthesia and local anesthesia were compared, the dehiscence rate was found to be significantly higher in cases with local anesthesia(30).

Finally, our analysis also showed that using a lower caliber polyglactin suture decreased the likelihood of dehiscence (OR=0.22). We speculate that wound dehiscence may be prevented or much reduced by the choice of thinner sutures . Thinner sutures may be preferred to minimize tissue trauma and potential dehiscence.

It is important to note that our study has certain limitations. Data were collected by individual interviews with 41 experts from different centers. The socio-economic levels and demographic features of the patient groups are not equal between compared groups and there is no selected patient group. It was evident that the clinicians we interviewed did not keep adequate records of case information collected retrospectively. In addition, preoperative and postoperative antibiotic use was different, which may well have been one of the factors affecting complication rates. However, since we did not receive enough information, we could not comment on whether this was significant or not.

There is an ongoing discussion about the various methods and techniques used in hymenoplasty treatment. This field was not taught in the curriculum for clinician training in our experience. Several techniques and methods have been proposed for hymenoplasty, however, there is no universally accepted or standardized method for it. According to a study, only 12% of doctors feel that they have enough knowledge to perform hymen aesthetics, while another study found that more than half of doctors require additional information and training on this topic (4,5).

The absence of similar studies in the literature makes our work pioneering for future research. We believe that standardized pre-op and post-op approaches that are not currently included in training curricula should be defined and added to training books. Although not medically necessary, hymenoplasty - a type of female genital cosmetic surgery (FGCS) - is becoming increasingly popular. We believe that standardizing practices in the field of FGCS, including hymenoplasty, and integrating them into the training curriculum is necessary.

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