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## Article

# Opinions of Gynaecologists about Indication and Technique of Perineoplasty

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**Abstract:** Background. Perineoplasty is a frequently performed procedure as part of prolapse surgery. Despite its frequent use, there is a lack of evidence on the optimal indication, surgical technique and adverse outcomes. We intended to gain insight into the current opinions on indications and technique of perineoplasty among (uro) gynecologists worldwide. Methods. We conducted a survey among members of the International Urogynecological Association (IUGA) to objectify indications for perineoplasty and aspects of surgical technique. Results. 114 urogynaecologists responded, 98% performing perineoplasty. 85% aimed to approximate the bulbocavernosus muscle whereas 27% aimed to include the puborectal muscle as well. 86% used 1-4 resorbable sutures, especially vicryl 2/0 (39%) or vicryl 0 (52%). According to the respondents, a "wide genital hiatus at physical examination" (87%) and "subjective complaints of a wide genital hiatus" (84%) were considered good/excellent indications for perineoplasty, whereas "fecal incontinence", "apical prolapse" and "perineal pain" were absolutely/mostly not a good indication. Reasons to not perform perineoplasty were pelvic pain (59%) and dyspareunia (64%). Most responders underlined the need for more research on this topic (8,5 out of 10). Conclusions. Perineoplasty is a frequently performed procedure. There is a wide variation on indications for- and surgical technique of- perineoplasty. Therefore research is needed to identify which patients will benefit of perineoplasty and how to optimally perform this surgery.

**Keywords:** perineoplasty; perineorrhaphy; indications; surgical technique; survey, prolapse; genital hiatus

## 1. Introduction

Perineoplasty, also referred to as perineorrhaphy, is a commonly performed procedure during pelvic organ prolapse (POP) surgery [1]. It is often combined with other vaginal or abdominal prolapse operations such as anterior and/or posterior colporrhaphy, sacrospinous fixation or sacrococcolpopexy but can also be performed as stand-alone procedure

Perineoplasty implies surgical repair of the perineum or perineal body [2]. It aims to restore level III support according to deLancey [3] and to reduce the size of the genital hiatus (GH). Nevertheless, the ideal indication criteria, when to withdrawal from the procedure, what anatomical structures should be involved, what suture materials should be used, the optimal number of sutures and other surgical aspects are not clearly described.

In recent years there has been evidence that an enlarged GH (which results in a lack of adequate support for the pelvic organs) is associated with the development of pelvic organ prolapse [4]. In addition, a wider GH after prolapse surgery was found to be an independent risk factor for recurrent POP or anatomic failure at follow-up [5–9]. Incorporating perineoplasty into prolapse surgery might provide additional support to the pelvic structures and improve the overall outcome. This extended support could potentially reduce the likelihood of recurrent prolapse and the need for re-intervention.

Furthermore, perineoplasty is sometimes performed with the aim of reducing urinary and fecal incontinence. Since the perineum plays a role in controlling the opening and closing of the urethra and anus, reinforcement in case of perineal descent or weakness might contribute to voluntary control over urination and defecation [10,11]. In case of a grade four obstetric perineal laceration the

functional outcome seems better when repairing the obstetric laceration is combined with performing a perineoplasty [12].

Moreover, the perineum is involved in sexual function, with its muscles and connective tissue contributing to vaginal tone and sensation. The perineal muscles play a role in sexual arousal and orgasm, highlighting the intricate relationship between the perineum and sexual health. A study of Dogan [13] described that surgical treatment of stress urinary incontinence (SUI) improves sexual function, and that this effect might be stronger when adding a perineoplasty in patients with perineal defect and vaginal enlargement. The procedure can be performed as stand-alone surgery as well to improve sexual function [14–17].

Finally some small studies suggest that perineoplasty is indicated for subjective symptoms related to a wide GH, like the sensation of a wide or open vagina, decreased friction during coitus or water or air going in and out the vagina during bathing or intercourse [14,16,18].

As shown above, the indications for performing a perineoplasty are not agreed upon and are wide and heterogeneous. As there is clear evidence that addressing level III support results in better anatomical and functional outcome, we intend to add knowledge on perineoplasty. We started to explore the opinion of urogynaecologists in which indications to perform a perineoplasty and to rank the importance of this indications. Secondly we intended to describe the variations in surgical technique among urogynaecologists worldwide.

## 2. Materials and Methods

We conducted a web based anonymous survey amongst all members of the International Urogynecological Association (IUGA). The survey was sent by email to IUGA members and was open to be completed from June-Dec 2023. During this period a total of three dedicated mailings about the survey were sent, there were two social media posts about it, the survey was visible on the IUGA website and it was mentioned in two general mailings of the IUGA.

The survey was tested before release on a panel of four (uro)gynaecologist working in different hospitals and settings.

The survey included a total of 23 questions. Surgeons' work experience and training were queried as were details about their surgical practice (size and characteristics). We asked in detail about the surgical technique that was used when performing a perineoplasty. This included questions about the excision of tissue, which muscles and structures are involved and the amount and type of sutures that are used. We identified nine indications to perform a perineoplasty and asked the respondents to rate these indications on a scale ranging from "absolute not a good indication" to "excellent indication" (converted to a 0-5 scale). The same we did with five reasons to withdrawal from performing a perineoplasty, ranging from "absolutely not a reason to withdrawal" to "excellent reason to withdrawal". Details about what at GH size a perineoplasty should be performed were queried. Furthermore we questioned them regarding their opinion of the scientific or clinical evidence for performing a perineoplasty and about how relevant is it to perform further research on the (possible) added value of perineoplasty on a scale of 1-10. On the end of the questionnaire there was space for free text on the topic.

We presented results as percentages per group, as well as means with SD. Means were calculated using the lowest category as 0 and the highest as 4.

### *Statistical Analysis*

We performed ordinal generalized linear modelling to study factors associated with indications for performing perineoplasty, as well as reasons not to perform this procedure. We included the years working as a specialist (reference 1-5 years), type of additional urogynaecological training (reference formal training), number of new patients per year per surgeon at the outpatient clinic (reference <400/year), number of POP surgeries per year (reference <100/year) and region (reference = Europe) as categorical variables and did not adjust for confounding factors. A factor was considered to be associated with the outcome if the p-value was below 0.05.

3. Results

A total of 114 urogynecologists from 43 different countries completed the survey. Of them 61% are a specialist for more than 10 years, and 21% less than 5 years. The majority followed a formal subspecialty training (57%). A majority of specialists (59%) treat less than 400 new prolapse patients per year. Regarding surgical volume half of them (50%) perform more than 100 procedures for prolapse per year (procedures for stress urinary incontinence not included) with 4% performing more than 250 procedures per year. In respect to the characteristics of their surgical practice, 94% regularly perform vaginal surgery, with 76% perform mainly vaginal procedure and less laparoscopic or robotic ones. (Table 1)

Table 1. Baseline.

|                                        |                                              | N   | %  |
|----------------------------------------|----------------------------------------------|-----|----|
| SPECIALTY                              | (Uro)gynecologist                            | 113 | 99 |
|                                        | Urologist                                    | 1   | 1  |
| HOW MANY YEARS WORKING AS A SPECIALIST | 1-5 years                                    | 24  | 21 |
|                                        | 5-10 years                                   | 21  | 18 |
|                                        | >10 years                                    | 69  | 61 |
| ADDITIONAL UROGYNÆCOLOGICAL TRAINING   | Formal training                              | 65  | 47 |
|                                        | Non-formal training                          | 35  | 31 |
|                                        | No additional training                       | 14  | 12 |
| HOW MANY NEW PATIENTS PER YEAR         | <400                                         | 67  | 59 |
|                                        | 400-800                                      | 43  | 38 |
|                                        | >800                                         | 4   | 4  |
| HOW MANY POP SURGERIES PER YEAR        | <100                                         | 57  | 50 |
|                                        | 100-250                                      | 52  | 46 |
|                                        | >250                                         | 5   | 4  |
| SURGICAL PRACTICE                      | 0-25 vaginal/ 75-100 laparoscopic or robotic | 7   | 6  |
|                                        | Around 50% vaginal/ around 50% lap/rob       | 21  | 18 |
|                                        | 75-100 vaginal/ 0-25% lap/rob                | 68  | 75 |
| REGION                                 | Europe                                       | 39  | 34 |
|                                        | USA/Canada                                   | 24  | 21 |
|                                        | Latin – America                              | 18  | 16 |
|                                        | Middle East                                  | 8   | 7  |
|                                        | Africa                                       | 13  | 11 |
|                                        | Asia (except middle east)                    | 5   | 4  |
|                                        | Oceania                                      | 7   | 6  |

Virtually all respondents (98%) sometimes perform perineoplasty during prolapse surgery. When characterizing the surgical technique, 85% re-approximates the bulbocavernosus muscle. We observed a variety regarding the amount of sutures used; 53% indicate they use mostly 1 or 2 sutures, while 33% use 3 to 4 sutures. With respect to the kind of sutures slightly more than half (52%) use type 0 sutures and 39% usually 2/0. Performing a perineoplasty is often part of prolapse surgery and is seldom performed as a stand-alone procedure. Almost all surgeons (91%) usually excises tissue during the procedure of which 74% individualizes the amount of excised tissue.

Regarding the question about at what hiatal size a perineoplasty could be considered, we observe that there is agreement that at a GH of less than 4 cm there is no indication for perineoplasty while at a GH of greater than 8 cm the majority of respondents would definitely perform one. On the

other hand there is no consensus on what would then be a good cut-off value; about 50% believe that an intervention should be performed at an HG from 4 cm onwards, while 42% believe this should only be an issue from 6 cm onwards. (Table 2)

**Table 2.** Surgical technique.

|                                                  |                                                                | N       |
|--------------------------------------------------|----------------------------------------------------------------|---------|
| <b>USUALLY EXCISES TISSUE AT PERINEOPLASTY</b>   | Yes                                                            | 103     |
|                                                  | No                                                             | 10      |
| <b>AMOUNT OF TISSUE EXCISE</b>                   | As restrictive as possible                                     | 23      |
|                                                  | Individualize                                                  | 81      |
|                                                  | As much as possible                                            | 0       |
|                                                  | Do not excise tissue                                           | 6       |
| <b>INTENTIONALLY NARROWING THE VAGINA</b>        | Always                                                         | 6       |
|                                                  | Often                                                          | 20      |
|                                                  | Depends on the case                                            | 77      |
|                                                  | Seldom                                                         | 8       |
|                                                  | Never                                                          | 2       |
| <b>INTENDING TO PREVENT NARROWING THE VAGINA</b> | Always                                                         | 31      |
|                                                  | Often                                                          | 22      |
|                                                  | Depends on the case                                            | 52      |
|                                                  | Seldom                                                         | 6       |
|                                                  | Never                                                          | 2       |
| <b>APPROXIMATE BULBOCAVERNOSUS MUSCLE</b>        | Yes                                                            | 96      |
|                                                  | No                                                             | 17      |
| <b>HOW MANY SUTURES</b>                          | 1-2 sutures                                                    | 52      |
|                                                  | 2-4 sutures                                                    | 33      |
|                                                  | >4 sutures                                                     | 4       |
|                                                  | Depends on the case                                            | 10      |
| <b>EXTEND SUTURING TO PUBORECTAL MUSCLE</b>      | Yes                                                            | 30      |
|                                                  | No                                                             | 83      |
| <b>KIND OF SUTURES</b>                           | Usually 2/0                                                    | 40      |
|                                                  | Usually 0                                                      | 53      |
|                                                  | Other                                                          | 9       |
| <b>COMBINED WITH PROLAPSE SURGERY</b>            | Always as a combination                                        | 37      |
|                                                  | Often as a combination                                         | 51      |
|                                                  | Depends on the case                                            | 24      |
|                                                  | Seldom as a combination                                        | 1       |
|                                                  | Never, always separate                                         | 0       |
| <b>AT WHAT SIZE WOULD YOU</b>                    | ≥2-4                                                           | 4 (4)   |
|                                                  | ≥4                                                             | 55 (48) |
|                                                  | ≥6                                                             | 47 (41) |
|                                                  | ≥8                                                             | 5 (4)   |
| <b>SCIENTIFIC EVIDENCE</b>                       | I do not know if there is any scientific evidence              | 30 (26) |
|                                                  | There is no scientific evidence to decide when it is indicated | 25 (22) |

|                            |                                                        |         |
|----------------------------|--------------------------------------------------------|---------|
|                            | There is scientific evidence to be liberal             | 4 (4)   |
|                            | There is scientific evidence to indicate some patients | 49 (43) |
|                            | There is scientific evidence not to indicate           | 6 (5)   |
| CLINICAL EVIDENCE          | NI do not know if there is no clinical evidence        | 9 (8)   |
|                            | There is clinical evidence to be liberal               | 22 (19) |
|                            | There is clinical evidence to indicate some patients   | 79 (69) |
|                            | There is clinical evidence not to indicate             | 3 (3)   |
|                            |                                                        |         |
|                            |                                                        |         |
| HOW RELEVANT (SCORE 0-100) | Median (SD)                                            | 85 (25) |

When looking at the indications to perform perineoplasty, overall the two most important indications for performing a perineoplasty are “wide genital hiatus at physical examination by POP-Q” and “subjective complaints of the patient of a wide genital hiatus (feeling of being open)”. Responders from Africa consider “wide genital hiatus at physical examination” significantly less a good indication to perform a perineoplasty than surgeons from other continents. Moreover, for responders from North America “subjective complaints of vaginal flatus” is significantly less a reason to perform perineoplasty than for surgeons elsewhere. “Subjective complaints of patients partner of insufficient friction during intercourse” is considered by the majority of the responders as not a good indication for the procedure as is fecal incontinence, except by surgeons from Oceania and Africa who assess this complaint in advance of performing a perineoplasty. Finally, surgeons who are more hesitant to perform a perineoplasty because of perineal skin problems less often had a formal training and surgeons who perform more prolapse surgeries per year are more hesitant perform perineoplasty because of perineal pain. (Table 3)

Table 3. reasons in favor.

|                                                                   | ABSOLUTELY<br>NOT | MOSTLY<br>NOT | NEUTRAL | SOMETIMES<br>GOOD | EXCELLENT | MEAN      | FACTORS<br>AFFECTING<br>RISK |
|-------------------------------------------------------------------|-------------------|---------------|---------|-------------------|-----------|-----------|------------------------------|
| WIDE GENITAL<br>HIATUS AT<br>PHYSICAL                             | 1 (1)             | 7 (6)         | 7 (6)   | 35 (31)           | 64 (56)   | 3.4 (0.9) | Africa ↓                     |
| SUBJECTIVE<br>COMPLAINTS<br>WIDE GENITAL<br>HIATUS                | 2 (2)             | 7 (6)         | 9 (8)   | 61 (54)           | 35 (31)   | 3.1 (0.9) | -                            |
| SUBJECTIVE<br>COMPLAINTS<br>VAGINAL<br>FLATUS                     | 6 (5)             | 13 (11)       | 36 (32) | 47 (41)           | 12 (11)   | 2.4 (1.0) | North America ↓              |
| SUBJECTIVE<br>COMPLAINTS<br>INSUFFICIENT<br>FRICTION<br>(PATIENT) | 7 (6)             | 26 (23)       | 21 (18) | 49 (43)           | 11 (10)   | 2.3 (1.1) | -                            |
| SUBJECTIVE<br>COMPLAINTS                                          | 29 (25)           | 28 (25)       | 27 (24) | 24 (21)           | 6 (5)     | 1.6 (1.2) | -                            |

|                                 |         |         |         |         |        |           |                                 |
|---------------------------------|---------|---------|---------|---------|--------|-----------|---------------------------------|
| INSUFFICIENT FRICTION (PARTNER) |         |         |         |         |        |           |                                 |
| FECAL INCONTINENCE              | 39 (34) | 34 (30) | 17 (15) | 13 (11) | 10 (9) | 1.3 (1.3) | Oceania↑<br>Africa↑             |
| MILD APICAL PROLAPSE            | 52 (46) | 35 (31) | 16(14)  | 10 (9)  | 1 (1)  | 0.9 (1.0) | -                               |
| PERINEAL PAIN                   | 55 (48) | 30 (26) | 16 (14) | 12 (11) | 1 (1)  | 0.9 (1.1) | Number of surgeries ↓           |
| PERINEAL SKIN PROBLEMS          | 36 (32) | 28 (25) | 26 (23) | 20 (18) | 4 (4)  | 1.4 (1.2) | No formal additional training ↓ |

Main reasons to refrain from perineoplasty during prolapse surgery are current pelvic pain and current dyspareunia. Fear of developing one of these two are also listed as reasons not to perform the procedure but surgeons from South America and responders with longer working experience do not consider "fear of developing dyspareunia" as a reason to refrain from perineoplasty. Prolonged time of surgery is not a reason not to perform perineoplasty when a surgeon thought it was indicated. (Table 4).

Table 4. Reasons to refrain.

|                     |                         |            |         |                |           |           |                                                |
|---------------------|-------------------------|------------|---------|----------------|-----------|-----------|------------------------------------------------|
|                     | ABSOLUTELY NOT A REASON | MOSTLY NOT | NEUTRAL | SOMETIMES GOOD | EXCELLENT | MEAN      | FACTORS AFFECTING REASONS                      |
| CURRENT PELVIC PAIN | 8 (7)                   | 24 (21)    | 14 (12) | 39 (34)        | 27 (24)   | 2.5 (1.3) | -                                              |
| CURRENT DYSPAREUNIA | 7 (6)                   | 21 (18)    | 13 (11) | 37 (33)        | 35 (31)   | 2.6 (1.3) | -                                              |
| FEAR OF PAIN        | 17 (15)                 | 22 (19)    | 22 (19) | 37 (33)        | 15 (13)   | 2.1 (1.3) | -                                              |
| FEAR OF DYSPAREUNIA | 10 (9)                  | 19 (17)    | 16 (14) | 39 (34)        | 27 (24)   | 2.5 (1.3) | Latin America ↓<br>Being a specialist longer ↓ |
| LONGER DURATION     | 65 (57)                 | 31 (27)    | 8 (7)   | 7 (6)          | 1 (1)     | 0.6 (0.9) | Number of surgeries ↓                          |

There is a difference in views regarding the scientific and the clinical evidence for performing a perineoplasty. Forty-six percent of the respondents believe there is scientific evidence while 89% of surgeons experience clinical evidence for performing the procedure.

The relevance of further research on the (possible) added value of perineoplasty was rated with an 8.5 on a 1-10 scale by the respondents.

In reaction to the free text space there were mainly remarks on either the need of further description of the technique like “we should describe much more accurately the technique” and “because perineorrhaphy is performed with such variability, research has to really qualify what is meant by the term to be helpful” or the endorsement of the clinical or scientific evidence, like “a wide hiatus is a reason for recurrence of POP as DeLancey showed in his studies”, “If properly performed it plays a tremendous role in psychological satisfaction of the patient along with relief of physical symptoms” and “very good topic that will generate very useful information”.

4. Discussion

In our survey we found that a vast majority of urogynecologists (89%) consider clinical evidence available to justify the performance of a perineoplasty during prolapse surgery and that this procedure belongs within the pallet of procedures regarding the surgical treatment of prolapse. Nevertheless there seems to be no consensus about when to perform it, what patients could benefit from the procedure and how a perineoplasty should exactly be performed.

The most important reason to perform a perineoplasty was “a wide genital hiatus at physical examination”. This is consistent with the literature describing that there appears to be a protective effect of a smaller GH on the development of prolapse [4,19] as well as that wider GH increases the risk on recurrent prolapse after surgical repair [1,5–9,20,21]. Bonglack ea [22] describe that the reduction of GH due to perineoplasty sustains after surgery, but their follow up was limited to three months, this is also reported by Mothes [23] who describe this persisting effect on GH post-operatively. However, to our knowledge, there is no known prospective study yet examining whether this reduction of the GH has a protective effect on the risk of recurrent prolapse.

Furthermore, when describing the GH at POP-Q examination one reflects what surgeons see at their physical examination and which is a representation of the GH at skin level. In our opinion this is the reason why the correlation between GH at POP-Q and effect of this GH on prolapse is limited. The level of the puborectal muscle is most likely more related to pelvic floor function, but can only be assessed based on palpation or imaging techniques. Due to the fact that in the GH via POP-Q determination the skin is measured and no assessment is made of the underlying muscle and connective tissue complex (which in fact determines the support and function of the pelvic floor) the GH might not be the most reliable factor related to the (re)occurrence of prolapse. Further research should preferably focus on measurement of the underlying muscle using techniques like (3D) ultrasound or MRI.

Taking a closer look at which patients could benefit from perineoplasty, the consideration “subjective complaints of a wide genital hiatus” was indicated as “sometimes good/excellent” by a large proportion (84%) of respondents, suggesting that this might be the group of women who benefit from this procedure. Performing a perineoplasty with the aim of tightening the vagina (diminish the sensation of a wide vagina) is described in different studies [14,16,17] and this aspect is often combined with the complaint of “insufficient friction during intercourse”. In our survey about half of the responders (53%) considered sexual complaints of the patient as a good/excellent reason to perform a perineoplasty, while different studies [15,17] describe improvement of sexual functioning in both patient and partner (without increase in risk of dyspareunia) as a result of perineoplasty in patients with a subjective feeling of a wide vagina. In our survey it appeared that only when the patient suffered of insufficient friction, urogynaecologists considered to perform perineoplasty and not if the partner experienced insufficient friction.

Fecal incontinence is only by a minority of responders (20%) seen as an indication for perineoplasty, which is confirmed by the paucity of literature on this topic. We only found studies that describe effects of perineoplasty when combined with sphincter surgery after OASI or in case of malformations [12,24]. Nevertheless, the clinical experience of the authors is that fecal complaints can improve after correction of the anatomy of the perineal body by performing a perineoplasty, so it might be hypothesized that perineoplasty has a positive effect on defecation symptoms. although this is not confirmed by current literature so further research on this topic might be useful.

In relation to the surgical technique a majority of the respondents (85%) indicate to suture the bulbocavernosus muscle while only 27% extends to the puborectal muscle. A study by Salehi [25] reports a de novo dyspareunia rate of 53% after perineoplasty when involving the puborectal muscle as well. This seems a high percentage and thus restraint with extending to the puborectal muscle might be considered. It is notable that individualization of the procedure is important to surgeons which represents the delicate balance between the possible positive effects of perineoplasty and adverse outcomes such as pain and dyspareunia. In addition, we believe it is essential to investigate and record exactly which anatomical structures should be involved in perineoplasty. Only by detailed description of the surgical technique it is possible to study the anatomical and functional outcome, and generalize findings of studies to the rest of the world.

In a recent article, deLancey [26] presented a detailed description of the functional anatomy of the perineal complex based on both MRI and cadaver studies. He showed that the connections between levator ani muscles, perineal membrane, perineal body and vaginal fascia all have a roll in the closure mechanism of the genital hiatus. This article could help to precisely describe a standard surgical technique when performing a perineoplasty with the aim of restoring hiatal closure. Next

step would be to perform a prospective study in which patients having surgery for prolapse with and without perineoplasty are compared in terms of surgical success, adverse outcomes etc.

One of the strengths of our study is that by including urogynaecologists from more than 40 countries our findings are generalizable worldwide. Of course there is some limitation: urogynaecologists with an interest for perineoplasty are more motivated to have participated in our survey. Furthermore it is known that such surveys always have relatively low responder rates, but with the final number of responses, we feel that all relevant topics related to perineoplasty have adequately been addressed.

The free space that we allowed showed that we did not fail to include relevant topics, and that colleagues share our opinion that level III support is relatively under addressed in existing scientific literature.

Given the practice variation and lack of the current existing scientific evidence, there is a strong need for more information. Prospective research will reduce the uncertainty and heterogeneity between physicians and is needed to identify which patients will benefit of perineoplasty and how this surgery can optimally be performed.

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