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Choosing the cosmetically superior laparoscopic access to the abdomen: the importance of the umbilicus

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Abstract

Background Single-incision laparoscopy (SIL) is a rapidly growing procedure in the field of surgery. The most frequent site of abdominal access is the umbilicus. Its appearance can be altered during SIL procedures. The literature suggests that the umbilicus plays an important role in the overall physical appearance of patients. This study therefore investigated the perception of the general population regarding the cosmetics of the umbilicus.

Methods An online survey with 10 questions about the aesthetic importance of the umbilicus was circulated worldwide in both the English and French languages. All the answers then were gathered and analyzed.

Results The majority of the participants considered both their umbilicus and that of their partner as “unimportant.” The total loss of their umbilicus and any undesired changes in its size, shape, and skin color were considered disturbing by most participants, but not its depth. In this survey, 39% of the women and 29% of the men agreed on a negative impact of an undesired change in their umbilicus, whereas 19% of the women and 36% of the men agreed on a negative impact of such a change in the umbilicus of their partner. The majority of the participants did not consider the umbilicus as playing a major role in sexual attractiveness.

Conclusions The majority of the participants gave a limited cosmetic role to the umbilicus and would therefore

be good candidates for an umbilical surgical access. Among the minority of participants who considered the umbilicus to be cosmetically important, the men tended to be more concerned about the aesthetic aspect of their partner’s umbilicus, and a one-third of them agreed on its role in sexual appeal. Although not the majority, a significant proportion of participants were sensitive about the aspect of their umbilicus. Special care should be given to identify this population and choose the appropriate minimally invasive access.

Keywords Cosmesis · LESS · SILS · Single-incision surgery · Umbilicus

In the field of minimally invasive surgery, single-incision laparoscopy (SIL) is rapidly gaining in importance, and an increasing number and variety of procedures are performed worldwide using this technique [1–5]. Although long-term results and large-scale feasibility still need to be evaluated by clinically controlled, randomized studies, the research performed to date suggests that SIL has better cosmetic results [6–8] than traditional laparoscopy and comparable postoperative outcomes [8–10].

The most frequent abdominal access point for SIL is the umbilicus. We hypothesize that an incision in the umbilicus may not always lead to a cosmetically favorable scar, especially if the scar is large compared with the size of the umbilicus. A scar of the umbilicus may lead to changes in its size, shape, depth, or skin color. Potential reasons may include the larger incision compared with that of traditional laparoscopy, which usually is required for instrumentation purposes, or the important shearing forces applied at the edge of the incision.

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The literature, mostly plastic surgery articles, supports the fact that the umbilicus is an important abdominal landmark and that it plays an important cosmetic role for most patients [11–13]. We therefore decided to evaluate the perception of the general population regarding the cosmetic aspect of the umbilicus and the potential post-operative umbilical modifications.

Materials and methods

We created an anonymous survey containing nine questions (Table 1). A short introduction was written to guide the responders and to explain the purpose of the study, thus making the surgical context clear. Three questions focused on personal information including gender, age, and level of education, and six questions evaluated the aesthetic importance of the umbilicus. These six questions each had a range of possible answers (e.g., “not at all,” “not,” “neutral,” “very,” “extremely”) to obtain finer results. The approximate time required to complete the survey was 10 min. The survey then was distributed personally online via www.kwiksurveys.com, with a tracking system to avoid participants completing the survey several times. Uncompleted surveys and surveys obviously completed incorrectly were deleted. We then gathered and statistically analyzed all the valid and completed surveys.

Results

We collected a total of 814 surveys. After deleting 75 surveys because of incompleteness or incorrectness, we

included 739 valid surveys in the study. The gender distribution was 66% women and 34% men. The median age of the survey participants was 24 years (range, 18–69 years).

Whereas 56% of the participants (54% of the women and 61% of the men) considered their umbilicus “unimportant,” 37% of the women and 24% of the men flagged it as “important” (Fig. 1). With regard to the importance of their partner’s umbilicus, 56% of the participants (60% of the women and 48% of the men) answered that it was “unimportant,” whereas 39% of the men and 23% of the women considered their partner’s umbilicus as “important” (Fig. 2).

The women mostly agreed (39%) and the men were mostly neutral (41%) about the statement: “a change in my belly button, if due to a side effect of surgery, would have a negative impact on my physical appearance” (Fig. 3). The same statement regarding the partner’s umbilicus elicited opposite results, with 37% of the women answering “neutral” and 36% of the men answering “agree” (Fig. 4).

The majority of the participants considered “disturbing” any changes in umbilicus size (47%), shape (44%), or skin color (48%). A change in umbilicus depth was considered “not disturbing” by 56% of the participants, whereas the total loss of the umbilicus was considered “disturbing” by 40% and “extremely disturbing” by 51% of the participants. There was no significant difference between the men and the women in their responses to this question (Figs. 5, 6, 7, 8, 9).

Regarding the statement “the belly button plays a major role in sexual attractiveness,” most of the women (34%) answered “disagree,” and most of the men (30%) answered “agree” (Fig. 10). Finally, to the statement “a scar on the

Table 1 Questionnaire

Question	Possible answers
1. Age	Number
2. Gender	Male/female
3. Education	Open space
4. How important do you consider your belly button in your overall appearance?	Not important at all–unimportant–important–extremely important
5. A change in my belly button, if due to a side effect of surgery, would have a negative impact on my physical appearance.	Strongly disagree–disagree–neutral–agree–strongly agree
6. How important do you consider the belly button of your partner in his/her overall appearance?	Not important at all–unimportant–important–extremely important
7. A change in the belly button of your partner, if due to a side effect of surgery, would have a negative impact on his/her physical appearance.	Not disturbing at all–not disturbing–disturbing–extremely disturbing
8. Surgeries through the belly button might alter its look as a side effect. How disturbing would you consider a change in size/shape/depth/skin color/total loss of the umbilicus?	Not disturbing at all–not disturbing–disturbing–extremely disturbing
9. Do you agree with the 2 following statements?	Strongly disagree–disagree–neutral–agree–strongly agree
(a) The belly button plays a major role in sexual attractiveness.	
(b) A scar on the belly button is worse than a scar anywhere else on the abdomen.	

Fig. 1 Overall importance of the umbilicus

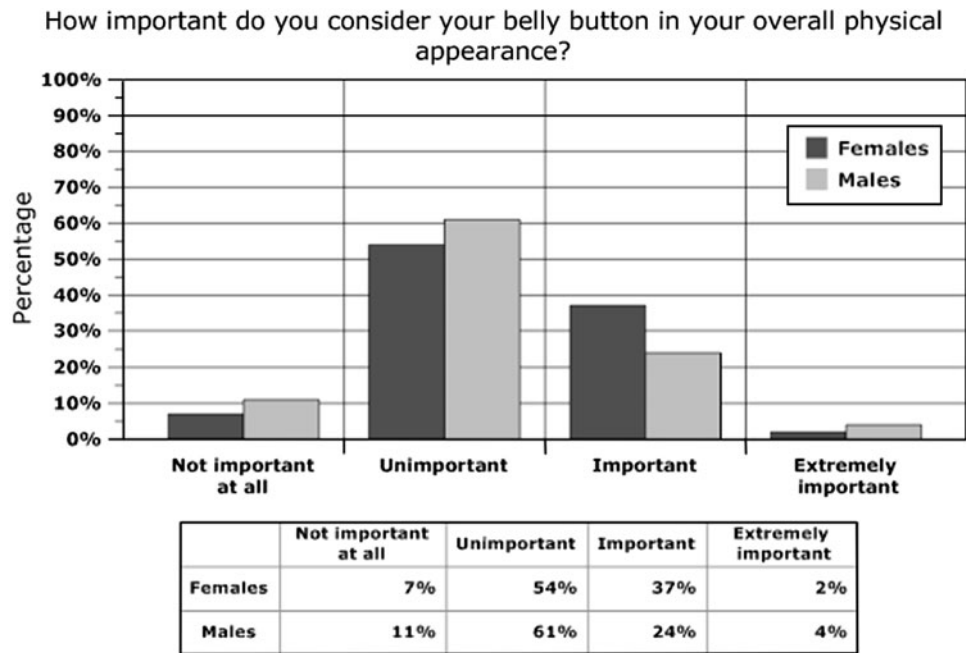
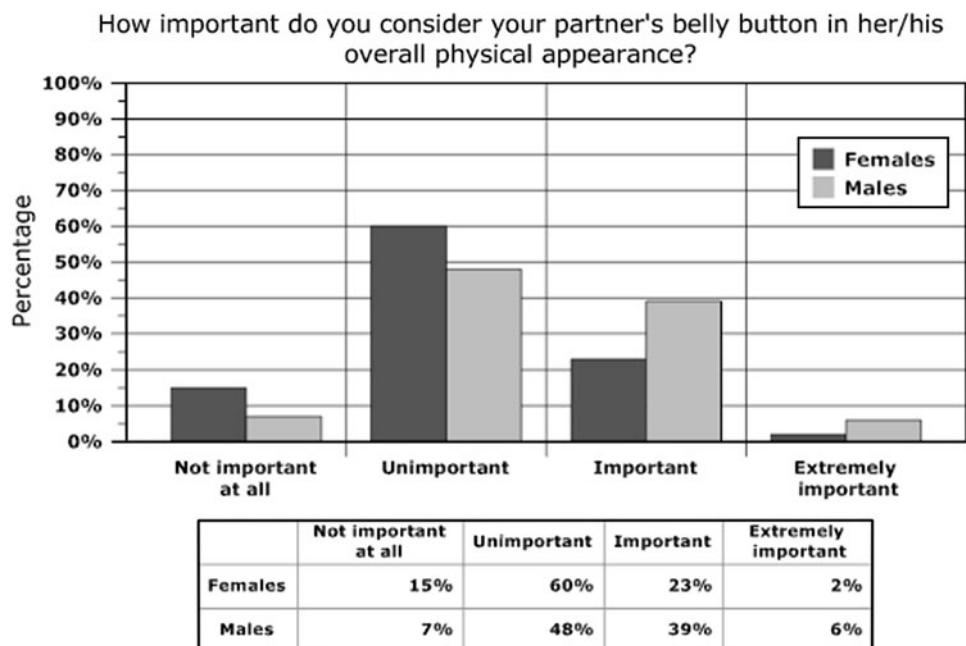


Fig. 2 Overall importance of the partner's umbilicus



abdomen is worse than a scar anywhere else on the abdomen,” the majority of the women (41%) answered “strongly disagree,” and the majority of the men (37%) answered “disagree.”

Discussion

This study aimed to determine whether the general population is particularly sensitive about the cosmetic aspect of the umbilicus or not in the flourishing context of new minimally

invasive techniques, notably SIL procedures. Due to its central location on the abdomen and its hollow shape, the umbilicus has always been considered an intuitive preferential access point for laparoscopic techniques in terms of both practical instrumentation and postoperative cosmetic results. We considered that every umbilical incision, regardless of its shape or size, had the potential of altering the umbilicus and thus creating aesthetic concerns for patients.

Our results show that the majority of both the women and the men in this survey gave only an overall limited cosmetic role to the umbilicus, whether their own or their

Fig. 3 Negative impact of an undesired change in the umbilicus

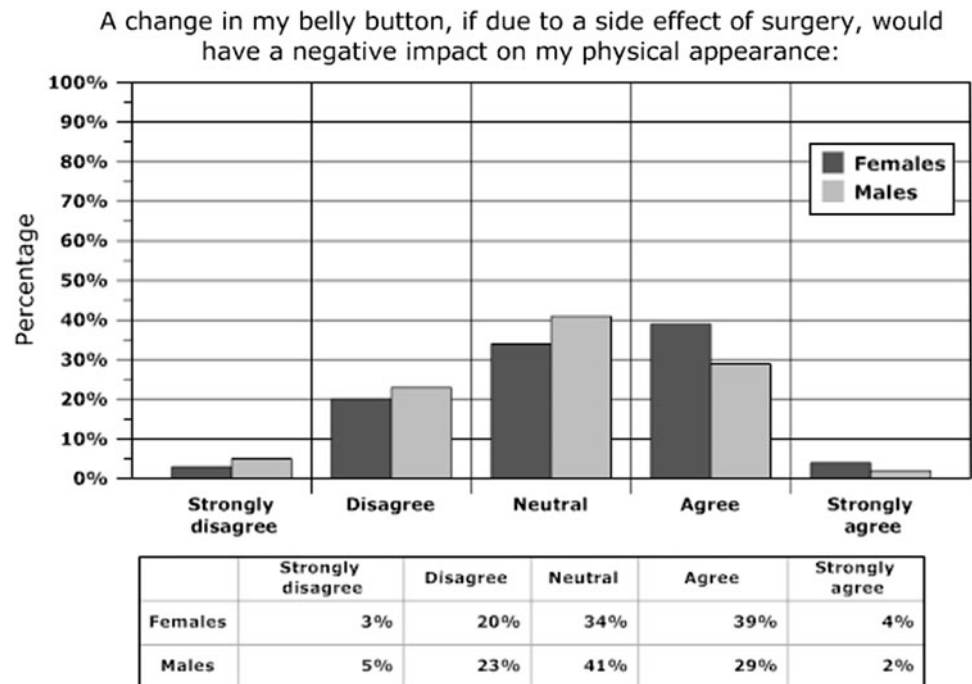
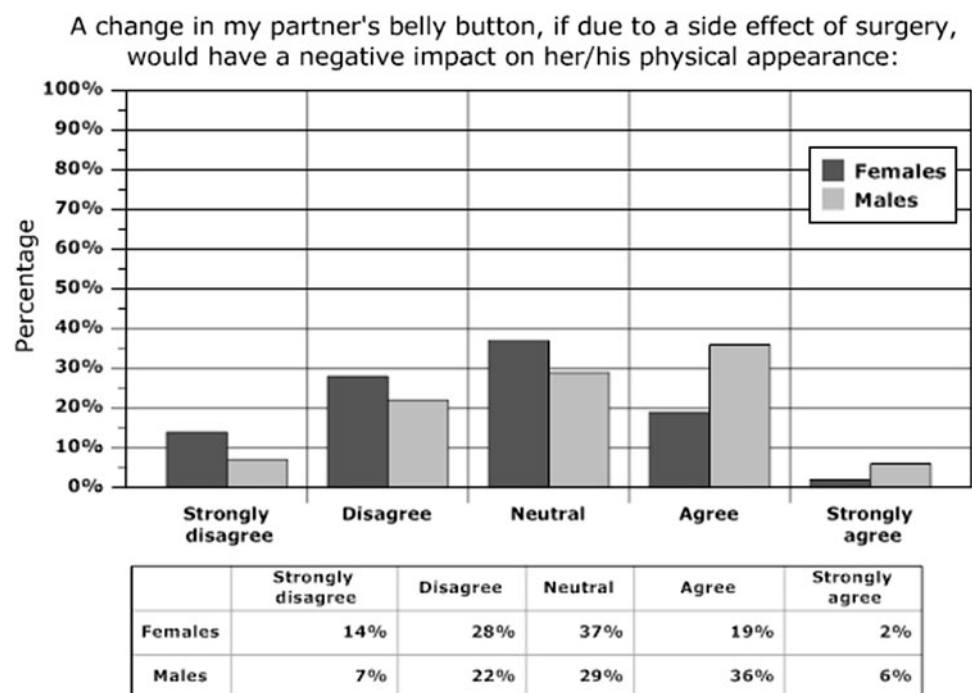


Fig. 4 Negative impact of an undesired change in the partner's umbilicus



partner's. The surveyed group would not mind an undesired change in the depth of their umbilicus secondary to a surgical procedure. However, a change in umbilicus size, shape, or skin color was considered disturbing. A total loss of the umbilicus, a very rare complication of transumbilical surgery, was regarded as extremely negative. We therefore consider this group, comprising the majority of the participants in our survey, as good potential candidates for SIL

procedures because they would be little affected, if at all, by minor unwanted changes to their umbilicus.

Nevertheless, we noted among other minor groups an interesting difference between males and females in a number of items. The findings for the participants who considered their umbilicus "important" or "extremely important" in their overall physical appearance showed that 39% of the women and 28% of the men were concerned. The

Fig. 5 Change in umbilicus size

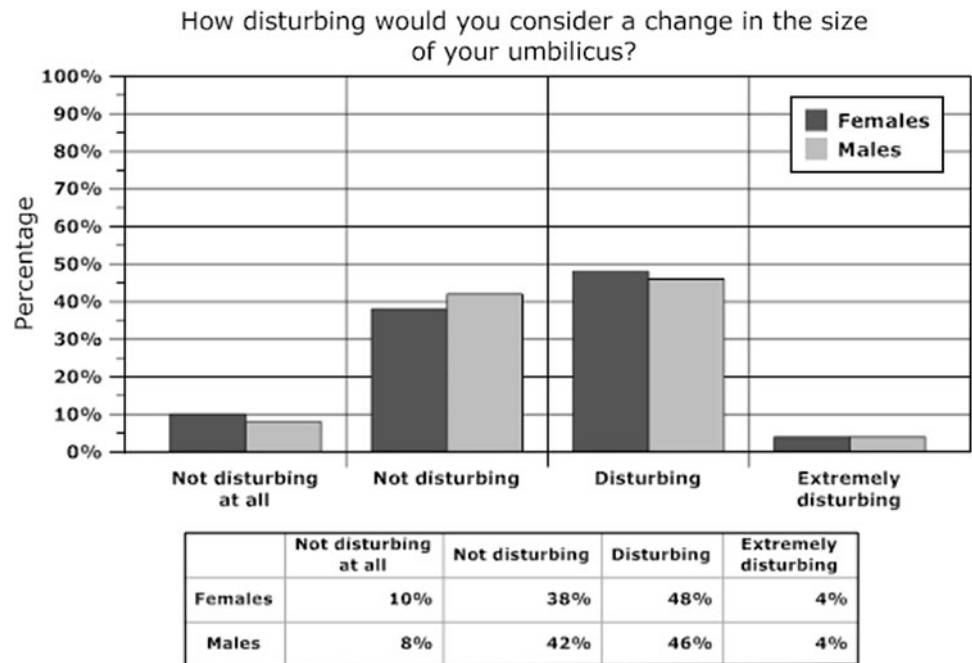
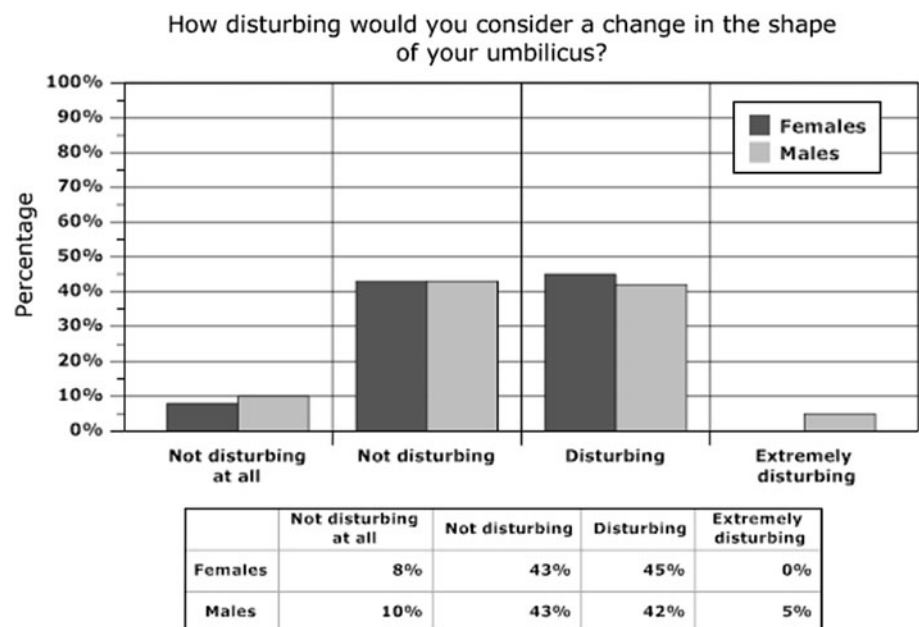


Fig. 6 Change in umbilicus shape



results were reversed regarding the partner’s umbilicus, with only 25% of the women considering it “important” or “extremely important” versus 45% of the men.

These results show that within this minority, the men tended to be more concerned about their partner’s umbilicus than about their own, with the women giving an opposite response. This fact was confirmed by the results for the statement about the sexual importance of the umbilicus, with 35% of the men agreeing or strongly agreeing compared with only 19% of the women.

We also noted among the minorities a group comprising approximately 4% of the women who were particularly sensitive about all aspects of the umbilicus. They gave mostly very polarized answers to the survey questions, especially those regarding their own umbilicus, showing an extreme care about its aesthetic aspect. For instance, this minority strongly agreed about the negative aesthetic impact of a change in the umbilicus as a side effect of surgery and found virtually all the specific changes to be extremely disturbing.

Fig. 7 Change in umbilicus depth

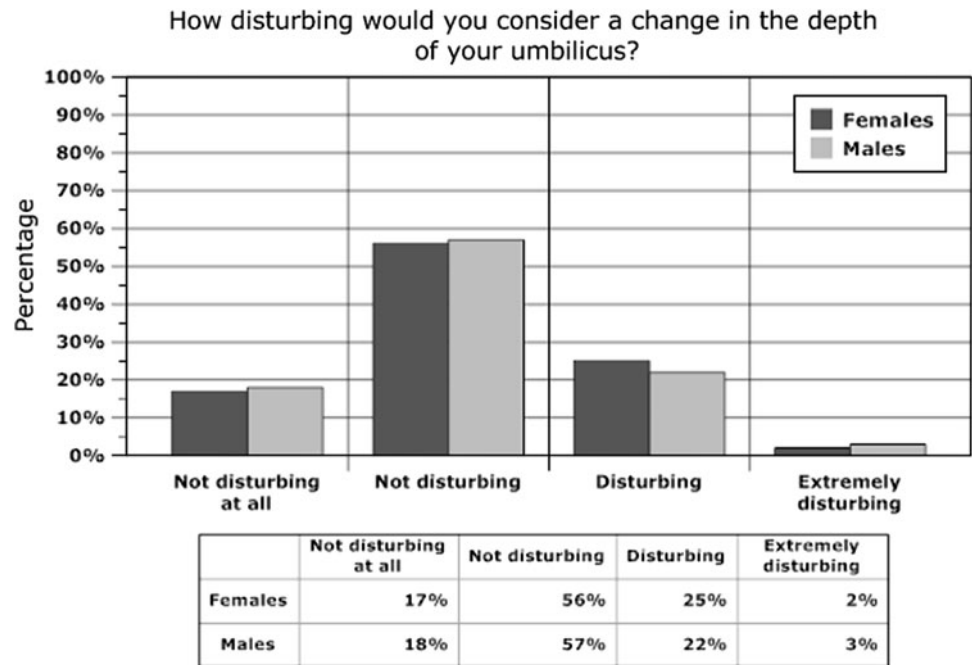
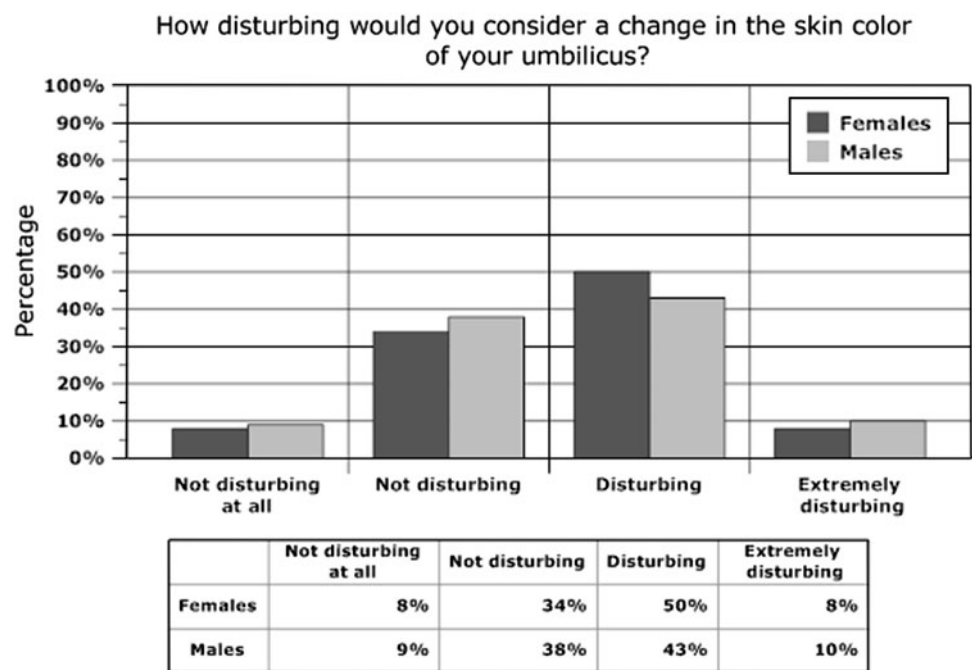


Fig. 8 Change in umbilicus skin color



However, this study had a number of limitations that need to be discussed. In our opinion, the major factors that must be taken into consideration are the Internet-related aspects. As mentioned in the [Results](#) section, the median age of our survey participants was 24 years, reflecting the fact that younger people tend to use computers and the Internet on a daily basis and most probably are more familiar with this type of media than the older generation. We therefore acknowledge an age-selection bias. As a consequence, our results concern mostly a young population approximately 18

to 30 years of age. Although a more extensive study should evaluate the results for the remaining population, we consider these results as a first approach concerning a population that certainly will have, due to its young age, a high degree of concern about its physical appearance and a higher probability of maintaining a surgically “untouched” abdomen.

The second problem we had to face was related to the anonymity inherent to the Internet. It is indeed very difficult, if not impossible, on an online platform to filter

Fig. 9 Total loss of the umbilicus

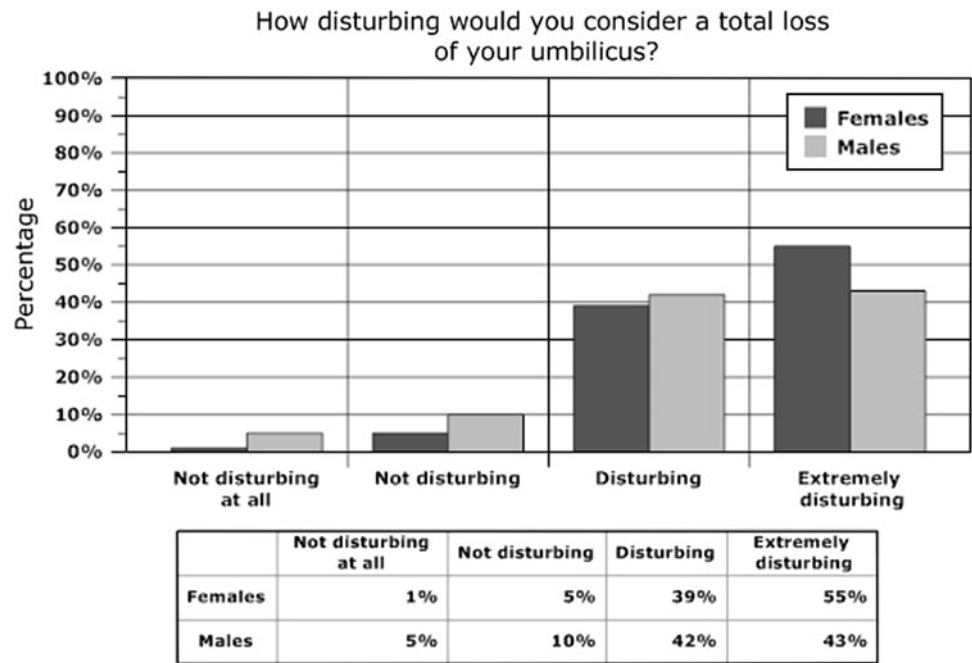
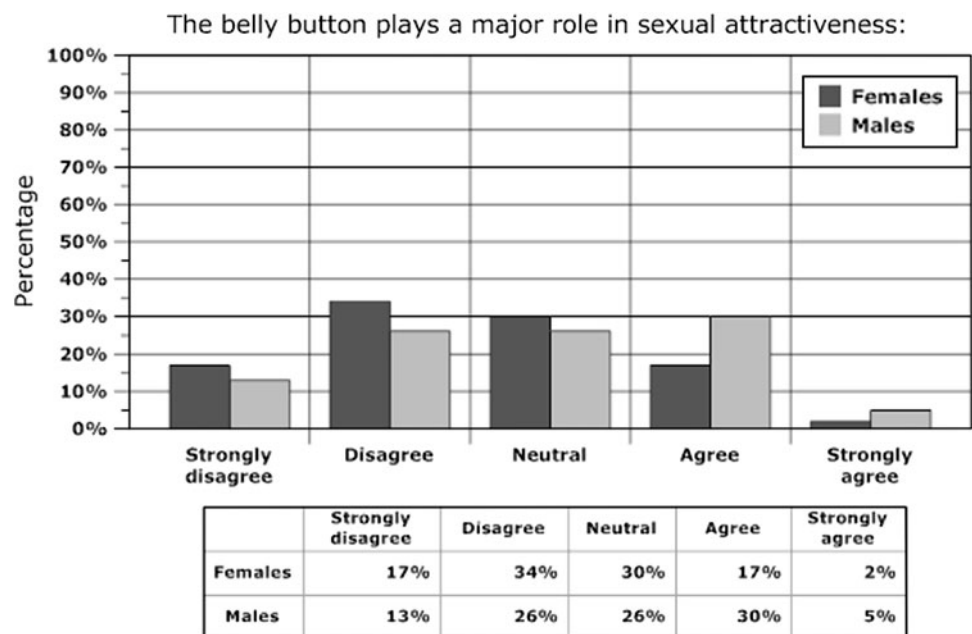


Fig. 10 Importance of the umbilicus in sexual attractiveness



undesired people (e.g., people who do not give honest answers and who tend to complete the survey as an entertainment). As mentioned in the [Materials and Methods](#) section, we tried to reduce this bias by deleting uncompleted surveys or surveys that contained bizarre answers (e.g., an impossible age or inappropriate comments).

Finally, as in every survey, no matter how much care is given into selecting and formulating the questions, the interpretation and perception of each individual still may slightly distort the validity of the answers. In that sense, previous research in the form of questionnaires about

cosmetic aspects of potentially cosmetically favorable surgical methods, primarily natural orifice transluminal endoscopic surgery, has reported varying results [14–16]. Therefore, the results of this study should only be recognized as a first attempt to assess the perception of potential patients toward their umbilicus.

Conclusions

Although SIL procedures have to date shown promising postoperative cosmetic results in terms of umbilical scars,

no large-scale, randomized, controlled studies are available to support this fact. The relatively recent emergence of SIL procedures implies that a long-term overview and evaluation of postoperative results are lacking as well. These reasons explain our hypothesis that every SIL procedure has the potential to alter the aspect of the umbilicus. Thus, it is important to assess the perception of the general population about this issue.

We conclude that the majority of our surveyed population, mostly young people 18 to 30 years of age, give little aesthetic importance to the umbilicus in their overall physical appearance. They also minimize its role in sexual attractiveness and, with the rare exception of a total loss of the umbilicus, they would not be affected by a change in its aspect. These survey participants would therefore be ideal candidates for SIL or other transumbilical techniques even if these procedures could result in a modified umbilicus.

On the other hand, some minorities need to be taken into consideration in the choice of an adequate surgical access. First, approximately 45% of the men in this survey showed particular sensitivity about their partner's umbilicus and considered that it played a major role in sexual attractiveness, a fact that could be important if their partner has to undergo transumbilical surgery. Furthermore, a small group representing 4% of the women showed high aesthetic sensitivity about their umbilicus and would be affected by virtually any modification in its aspect. These particularly concerned potential patients should be identified before surgery. They should receive thorough counseling about the different surgical methods, and special care should be given in choosing the appropriate intraabdominal access with them.

Disclosures Pouya Iranmanesh, Philippe Morel, Ihsan Inan, and Monika Hagen have no conflicts of interest or financial ties to disclose.

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