



A new tool for intraoperative marking

Um novo instrumento para marcação intraoperatória

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■ ABSTRACT

This article describes the adaptation of a micro-punch mandrel, which is usually used in hair transplants, in intraoperative markings. The mandrel was used as a wire for sterile toothpick handling in different surgical marking procedures, such as those in abdominoplasties, mammoplasties, and rhytidectomies. The use of this instrument offers a comfortable, affordable, precise, and low-cost tool for all types of surgical marking performed in plastic surgery. It is cheaper and more efficient than disposable pens.

Keywords: Surgical instruments; Reconstructive surgical procedures; Abdominoplasty; Mammoplasty; Rhytidoplasty.

■ RESUMO

Este artigo descreve a adaptação de um mandril de *micro-punch* - normalmente empregado em transplantes capilares - para uso em marcações intraoperatórias. O mandril foi usado como cabo para manuseio de palitos de dente esterilizados nas demarcações de procedimentos cirúrgicos diversos, como abdominoplastias, mamoplastias e ritidoplastias. O emprego deste instrumento oferece um meio confortável, acessível, preciso e de baixo custo para todos os tipos de marcações cirúrgicas em cirurgia plástica, sendo mais barato e eficiente do que canetas demarcatórias descartáveis.

Descritores: Instrumentos cirúrgicos; Procedimentos cirúrgicos reconstrutivos; Abdominoplastia; Mamoplastia; Ritidoplastia.

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INTRODUCTION

Preoperative surgical marking is an important routine in most plastic, aesthetic, and reconstructive procedures. The literature shows that the concern about the durability of the markers used preoperatively or intraoperatively is no longer relevant, as the best marking methods have been described in several studies along with the best tools and dyes¹.

However, much less attention was given to developing an efficient system for intraoperative marking. A small number of articles discuss this step², which is key in different procedures owing to the inevitable fading of preoperative markings caused by degermation and preoperative application of antiseptic solutions, manipulation of the surgical site, and skin contact with fluids and secretions of the patient while performing the surgery^{2,3}. Moreover, in many procedures, a new intraoperative marking needs to be developed or previously drawn markings need to be modified, in view of possible changes or additions to incisions initially planned.

Sterile plastic pens with a felt tip became an option that gained some popularity. However, the use of these tools results in additional costs to each procedure, as they are not reusable. Moreover, they tend to fail during surgery, as the felt becomes saturated with the fluids released by the body of the patient and the moisture of the skin itself. Therefore, more than one pen is often required in the same surgery^{2,3}.

A cheap and widely available alternative to intraoperative markers is the use of sterile toothpicks embedded in biocompatible dyes such as methylene blue, brilliant green, or gentian violet. One of the difficulties found in using this method is the lack of ergonomics in toothpick handling, which is normally too small for a comfortable and precise use in drawing the markings. Holding the toothpicks with Kelly or Allis surgical forceps contributes little to reduce this limitation. Moreover, toothpick fractures, caused by the forceps itself, are frequent.

OBJECTIVE

This study presents an efficient and low-cost option to drawing markings during surgery, combining the good accessibility of toothpicks, ergonomics, and accuracy of a surgical instrument.

METHODS

A *micro-punch* mandrel (Richter Surgical Instruments, São Paulo, SP), which is normally used in hair transplants, has been adapted to be used as a wire for toothpick handling (Figure 1). The toothpick is inserted in the mandrel, which has a thread for the proper fit and

hold of the toothpick. The length of the mandrel is 6.45 cm, but the addition of a common toothpick results in a mandrel-toothpick assembly of 11.14 cm long, which is close to that of a regular ballpoint pen (Figure 2).



Figure 1. *Micro-punch* mandrel alongside the toothpick.



Figure 2. Comparison of dimensions between the mandrel-toothpick assembly and a common ballpoint pen.

Therefore, the mandrel-toothpick assembly can then be soaked in biocompatible dyes and handled like a pen, while performing the markings during surgery (Figure 3).

RESULTS

The instrument described has been used in all types of surgical procedures that have been performed by our team. The tool provided satisfactory results in terms of increased accuracy of intraoperative markings, comfort in handling the tool, and absence of toothpick fractures while drawing the markings.



Figure 3. Demonstration of the mandrel-toothpick assembly handling in intraoperative markings.

DISCUSSION

Preoperative surgical marking has been reported since the beginning of plastic surgery procedures, with Sushruta Samhita describing the use of plant leaves for demarcation of nasal flaps. This procedure progressed over the centuries, from when leather and wax molds started to be used until reaching the most widespread use of incision markings with paints and dyes from the 19th century¹.

Less attention was given to intraoperative surgical marking, as confirmed in relevant literature. The article published by Weiss⁴ in 1947 is worth highlighting, as it advocates the use of technical pens and precision calipers of aluminum and steel, which are sterilized in germicidal solutions before use in surgery. However, this option is not currently proscribed, as germicidal sterilization is no longer accepted as satisfactory to sterilize surgical instruments. However, no experience in using different forms of sterilization of these tools has been described yet.

Comess and Masson,⁵ in 1957, supported the use of metal loads of ballpoint pens for intraoperative marking, stating that the cartridges could be repeatedly autoclaved or sterilized with cold antiseptic solutions. The authors emphasize the need for a clean and dry surface for the efficient functioning of the cartridges, which leads to the same problem as that with disposable felt-tip markers.

In 1988, Kjar and Jackson³ already proposed the assembly of an instrument for sterile marking based on a disposable 3-mL syringe and a 22- or 25-G needle. The needle-syringe assembly was then used to mark the incisions after being filled with methylene blue. The

assembly of this tool seems a bit laborious and involves risks inherent to the use of sharp material during its preparation and use. However, it is worth mentioning that the authors point at disposable pens as an unattractive alternative because of their high cost, low efficiency, and durability.

The same point of view was supported by Boettcher and Komorowska-Timek in a recent publication², in which they propose the disassembly of a sterile marking pen and the use of its cartridge only as a marker during surgery. This idea seems quite effective but requires the use of at least one disposable pen per procedure. In addition, it has the disadvantage of producing too thick drawing strokes, which can impede the realization of more delicate and accurate markings.

CONCLUSION

The use of a *micro-punch* mandrel with sterile toothpicks offers a low-cost, affordable, and long-lasting alternative, as it consists of widely available tools that do not require major changes to be used in preoperative markings. According to how these are performed or elaborated, the marking should start by using a drawing method that is quite familiar to most plastic surgeons and can be used in all types of intraoperative marking. The result is an accurate, ergonomic, and economic marking method, which benefits the surgeon, the patient, and the hospital.

COLLABORATIONS

- GFS** Data analysis and interpretation; statistical analysis; conception and study design; implementation of surgical procedures and experiments; writing of the manuscript; and final approval of the manuscript.
- INS** Aid in preparation of the figures; critical review of the content; and final approval of the manuscript.

REFERENCES

1. Granick MS, Heckler FR, Jones EW. Surgical skin-marking techniques. *Plast Reconstr Surg.* 1987;79(4):573-80.
2. Boettcher AK, Komorowska-Timek ED. Maximizing the economics of the marking pen. *Plast Reconstr Surg.* 2012;129(3):606e-607e.
3. Kjar JG, Jackson IT. A simple instrument for surgical tattooing and skin marking. *Plast Reconstr Surg.* 1988;81(1):106-8.
4. Weiss JA. Inking pens for skin marking in plastic surgery. *Plast Reconstr Surg.* (1946). 1947;2(1):91.
5. Comess MS, Masson JK. A new method of skin marking. *Plast Reconstr Surg.* (1946). 1957;20(1):83-4.

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