ORIGINAL ARTICLE

# Modification to the Maryland Forceps

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## Abstract

All laparoscopic surgeons, adult or pediatric, would be familiar with the ubiquitous Maryland forceps, a dissector used as an indispensable tool in various day-to-day laparoscopic procedures. However, it is limited in its use because it has a smooth surface on the outer surface of the jaws, which causes it to slip during dissection. Thus, it not only takes longer but also makes it more difficult to dissect tissues during the procedure. To tackle this problem, we came up with a modification of our own which would make it easier to use this instrument by reducing the slippage that occurs during the procedure.

**Keywords:** Dissection, Laparoscopy, Laparoscopic surgery, Maryland dissector, Technical modification.

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## Introduction

All laparoscopic surgeons, adult or pediatric, would be familiar with the ubiquitous Maryland forceps, which is an indispensable instrument in laparoscopic surgery.

It is a pair of dissecting forceps that may have a curved or a straight end with serrations on the inner surface of the jaws. It is used for dissection in various planes of different tissues during a laparoscopic procedure. However, a pertinent problem with the Maryland dissecting forceps is that it has a smooth surface on the outer surface of the jaws, which causes them to slip during dissection. Thus, it takes longer and also makes it more difficult to dissect tissues during the procedure.

To tackle this problem, we came up with a modification of our own which would make it easier to use this instrument by reducing the slippage that occurs during the procedure.

## Aims and Objectives

- To make a modification to the widely used Maryland laparoscopic dissector forceps enabling better use in pediatric surgery.
- To minimize tissue slippage.

## Materials and Methods

Our modification to Maryland's forceps involves having serrations on the outer surface of the blades, close to the tip of the forceps, along with the inner surface, which will provide a better grip and thus reduce tissue slippage, therefore making it easier to perform dissections during the procedure.

The following are the design changes that we made to the original design of Maryland forceps (Figs 1 to 4):

- The forceps will have two blades which may be straight or may be curved.
- The blades will have vertical serrations on the inner surface and also have serrations on the outer surface close to the tip of the blades to provide a better grip to the blade while dissecting through the tissues.
- The internal serrations shall provide a grip for holding the tissues while the external serrations shall provide a grip while dissecting through the tissue.

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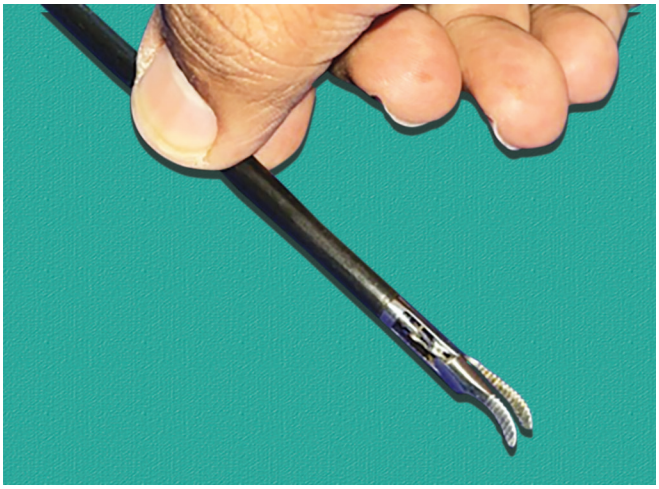

**Fig. 1:** Curved forceps blade

- The forceps shall be available in three diameters, namely, 3, 5, and 10 mm.

**Fig. 2:** Vertical serrations on the inner surface and on the outer surface close to the tip of the blades to provide better grip

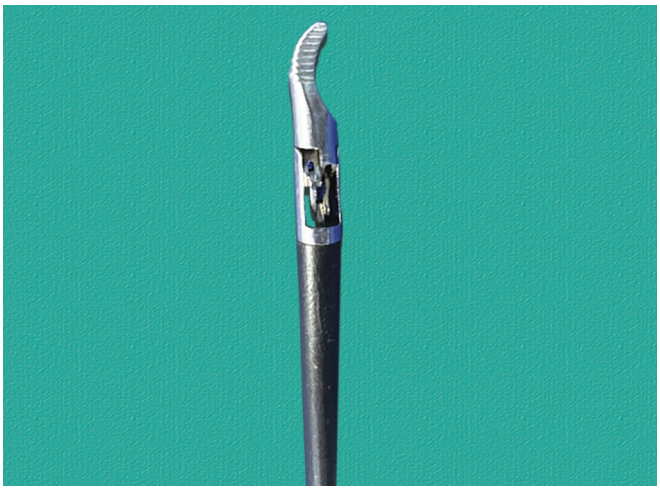

**Fig. 3:** External serrations provide grip while dissecting through the tissue

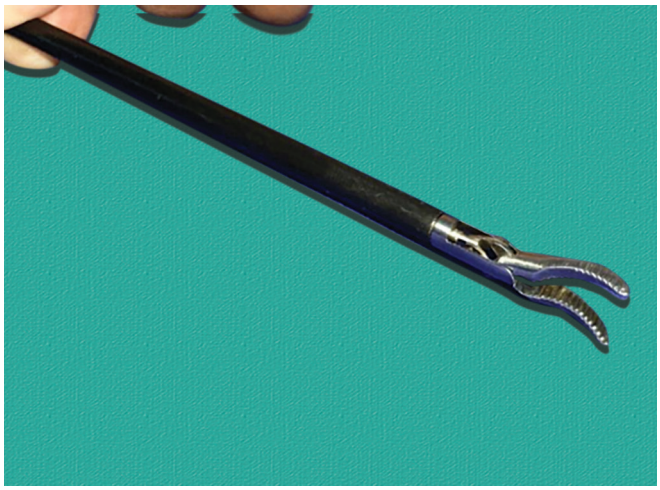

**Fig. 4:** The internal serrations provide a grip for holding the tissues

- The forceps shall be available in two lengths, namely, 20 and 25 cm.
- Various combinations of diameter and length shall be available.

Most laparoscopic surgeries make use of Maryland dissector for tissue dissection and space creation. Different designers and researchers have contributed to the evolving design of the Maryland forceps starting from the early 90s. In 1992, it was Smith[1] who patented the disposable Maryland dissectors which are widely used nowadays. At the turn of the century, the following two modified designs came into vogue: The first by Moran et al.[2] in 2008 and the second by Batchelor et al.[3] in 2015. Lee et al.[4] proposed a modification aiding in better tactile and pressure-sensing feedback in 2016.

These forceps are available as both unipolar and bipolar instruments.[5–7]

One of the drawbacks of the Maryland dissector has been that tissue tends to slip out between its jaws surface during laparoscopic dissection, owing to its smooth outer surface. This is especially of note in pediatric surgeries when one is dealing with limited available space within the body cavity. Therefore, sometimes it becomes difficult to dissect tissues and the operating time increases.

The proposed modifications to the universally available Maryland forceps aim to reduce some of its flaws.

## Conclusion

This modification to the jaws of the Maryland dissector helps lessen chances of major injury to vital structures by negating the need for many laparoscopic instruments, need for frequent readjustments, especially in pediatric surgeries. Major organ injuries due to instrument slippage and the amount of intraoperative blood loss, are hence reduced, and postoperative comfort is improved with the need for lower analgesic doses for postoperative pain relief.

This instrument is designed in such a way that it can be completely taken apart and put together, as the modification only entails changes to the jaws of the forceps. This ensures that each individual component can be sterilized optimally and thoroughly without compromise. Also, the design allows for multiple uses of the instrument thereby reducing costs further.

The manufacturing cost too is negligible since minimal changes need to be made to the existing jaw design which can be easily accomplished.

Wider usage and adoption of this modification may prove helpful in reducing operative times and tissue injury due to slippage, especially in pediatric surgery.

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