

# Fiver Optic Grossing Pen

Aklesha Behera\*

Department of Oral Pathology, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Kuthambakkam, Tamil Nadu, India

## ABSTRACT

Grossing is the most important part of any histopathological diagnosis. Traditionally, grossing is done using BP Blade and handle, but with recent advancement in technologies, there are various modified devices available which makes grossing less cumbersome and hassle free. Such devices are patented and are manufactured via various medical instrument manufacturing companies. The grossing device which is fabricated by us is slender, sleek and resembles a design of a pen. The entire body is made of stainless steel, with a rubber grip, providing a better stability and grasp. The most notable factor about this device is that it will have an inbuilt fiber optic lighting device which will make the device one of the best precision dissection devices. The pathologist will not have a problem with poor illumination during the dissection procedure.

**Keywords:** Fiber Optic light source; Handle for fixing BP blade; Histopathological diagnosis

## INTRODUCTION

Grossing is a gross examination of surgical specimens in which pathologists inspect the excised specimen with the bare eye to obtain diagnostic information [1,2]. It refers to the examination and dissection of surgical specimens, along with preparation of sections from those tissues requiring processing, and is the initial step in surgical pathology dissection [3,4]. Careful handling of the tissue with proper fixation and tissue processing will enable a confident histopathological diagnosis. The biopsy grossing triage facilitates optimal handling of processing starting at specimen receipt. Many mistakes, besides specimen misidentification, occur at the initial preanalytical phase during specimen accession. The grossing person is instrumental in managing the accession process. Although very often neither pathologists nor pathology residents are closely involved in biopsy triage, it is important to understand the process for effective control of this phase of grossing. Grossing is traditionally carried out using a BP blade and BP handle [5]. The handle and the blade are used like in any other surgical procedures. The blade is used to make a dissection or to make a surgical section of any tissue margins. As oral pathologists, we dissect many tissues like buccal mucosa, gingiva, muscle, bone and lymph nodes. The lymph nodes are enclosed in a thick layer of adipose tissue. Upon dissection, the adipose tissue releases a lot of fat, hence making the instrument unstable. The BP blade doesn't provide a firm grip. If it is contaminated with tissue fluids, it becomes difficult to handle the blade. Like many new aged surgical instruments,

even grossing instruments for tissue dissection have come with advanced features. Modified blades and knives are also present in the market. Grossing is mostly done on a grossing table or board under natural or artificial lighting. There is hardly any instrument for tissue grossing which comes with a fiber optic light. Hence, it was our aim to fabricate an instrument which can provide a firm grip, and a better illumination, almost like a pen, which is handy and is easy to autoclave

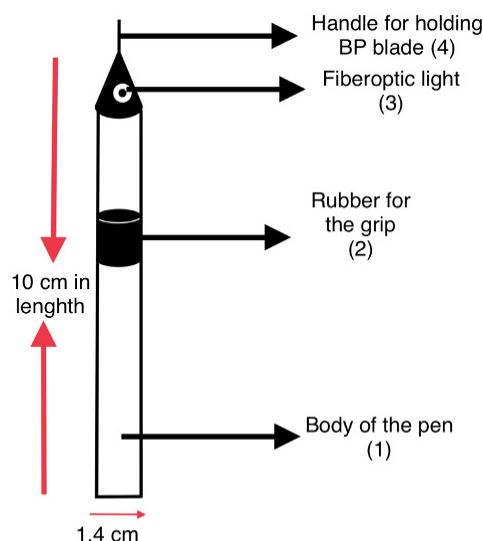


Figure 1: Instrument design and description.

**Correspondence to:** Behera A, Department of Oral Pathology, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Kuthambakkam, Tamil Nadu, India. Tel: + 8670421204; E-mail: akleshabehera@gmail.com

**Received:** July 04, 2021, **Accepted:** August 16, 2021, **Published:** August 30, 2021

**Citation:** Behera A (2021) Fiver Optic Grossing Pen. J Biomed Eng & Med Dev 6:179.

**Copyright:** © 2021 Behera A. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

## MATERIALS AND METHODS

The name of the instrument is Fiber Optic Grossing Pen. It is used for grossing of excised or incised tissue specimens.

The grossing pen will have a metal body with rubber grip with indentations which will help in giving a proper grip to the fingers. The rubber grip can be detached from the body of the metal handle. It will also have an attachment which can accommodate the BP blade of any size. The special quality of this grossing pen is that it will have an inbuilt fiber optic light. The light will help in better illumination of the tissues, hence helping in better visibility. Parts of the instrument are:

- 1: Body of the instrument
- 2: Rubber for the grip
- 3: Fiber Optic light source
- 4: Handle for fixing BP blade

The aim of providing a metal body for this grossing pen because it will be easy to autoclave after grossing is done. The grossing instrument is slender and sleek which would be light in weight and easy to handle.

### Instrument design and description

As described above, the grossing instrument will be like any other BP handles, with few notable modifications. The length of the instrument shall remain to be the standard 10 cm and the width is 1.4 cm, as a little longer or shorter working handle will become cumbersome to work with. Instead of a flattened surface, it will be spherical in shape, just like a normal writing pen. The instrument will be made of stainless steel, hence minimising the possibility of corrosion. As it will be made of metal, there won't be any compromise with the autoclaving procedure [6] (Figure 1).

The most important part of this instrument is the addition of a fiber optic lighting system which is battery operated. The lighting system will be attached closer to the nib of the instrument, which will lead to a better visualisation. Addition of fiberoptic external lighting systems in precision instruments is a concept not alien anymore. With the recent advancements, the future of biomedical engineering looks promising. The fiber optic technology is used widely in medicine and dentistry [7,8]. In this instrument, the fiber optic technology will be used for visualisation.

A nib will be attached at the tip of the instrument, which will harbour a carbon steel knife, just like any BP handle. All types of BP knives can be attached to this instrument.

### Advantages of the instruments

- Compact instrument
- Easy to handle
- Maximum instrument stability
- Attached internal light source for better visibility
- Looks and works as a pen, hence no special finger grasps or finger technique is required for using the instrument.
- Energy efficient
- Easy to sterilise or autoclave

## DISCUSSION

Grossing of specimens is the first and foremost step in the process

of a proper histopathological diagnosis [9]. The grossing and dissection instruments and setups have advanced a lot. Many colleges and workplaces are using a grossing setup which has stations like a grossing table, a water outlet, a shade, a light source and a shelf to keep reagents. There are grossing boards available which have a scale attached to it. Modifications with surgical blades, knives, bone cutters, saw and many more. Recently enough, innovations pertaining to tissue processing units, embedding cassettes and stamps are also being used widely.

Grossing mats are also used instead of the grossing slates, which are easier to clean and handle. Slicing devices for grossing are also available. The specimen is kept on a foam board and the device is pressed on it, leading to fine and uniform sections.

It is free from the hassle of cutting up an entire specimen using BP blade and handle. Another device that is available in the market is a smaller version of the above mentioned device. It resembles a vegetable chopper with a handle with fine blades. It can be used to gross smaller circumscribed specimens such as a soft tissue pedunculated or a sessile tumor. The blades are closely placed hence providing finer sections. Certain modified saws are used for the bone cutting and sectioning.

Innovations in the field of art and science of grossing and dissection are going to be a boon for all pathologists, where instruments and the related armamentarium play an important part. We hope, with this invention, we can bring over easy working instruments with a newer momentum in the field of pathological grossing.

## CONCLUSION

The fiber optic grossing pen is a suave dissecting instrument which has the potential to become the future of grossing and dissection equipment. It is lightweight, easy to handle, pocket friendly, stylish with great modifications such as a light source, cylindrical design with a rubber grip, and a nib which accommodates all the types of BP blades. The fiber optic technology is a rage in medical and artificial intelligence. It is used in many precision instruments such as in medical imaging, surgical procedures, microscopes and many more. With a promising technology inculcated with the classic gold marked conventional principle and design, the Fiber Optic Grossing pen shall deliver even more than what is expected.

## REFERENCES

1. Moulin A. Tips and tricks in grossing & processing specimens. *Acta Ophthalmol.* 2017;95.
2. Thirumala S, Pinkhasov D, Medalie N. A simple yet effective technique to improve laboratory safety for the grossing of large surgical specimens. *Ann Diagn Pathol.* 2000;4(1):44-45.
3. Mok D. Diagnostic surgical pathology of the head and neck E-Book. *Aust J Med Sci.* 2010;31(4):140.
4. Gnepp DR, Bishop JA. Gnepp's Diagnostic Surgical Pathology of the Head and Neck E-Book. Elsevier Health Sciences. 2020;5.
5. Schadle J. Naso-pharyngeal blades and universal handles. *J am Med Assoc.* 1896;26(1):41-42.
6. Al-Azzawi A. Fibre Optics: Principles and Advanced Practices. CRC Press, USA, 2017.
7. Tricker R. Optoelectronics and fiber optic technology. Newnes, 2002.
8. Huttner B. Troubleshooting tools for fiber optic cables. In: 2010 Avionics, Fiber-Optics and Photonics Technology Conference. IEEE, 2010; 31-32.
9. Ekinci Ö. Evaluation of All Surgical Margins in Pancreatic Resection Specimens by Proper Grossing Techniques: Surgical Pathology Experience of 285 Cases. *Turk Patoloji Derg.* 2018;34(3):242-246.