Photography in Dentistry

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Introduction

A good clinician understands the different treatment modalities, but a great clinician is the one who makes the patient understand the same. Dental photography helps us explain the treatment plan to the patient and convince the patient.

In the past, dental photography served as a hobby, which only few people practised. Due to the advancement in material sciences, and oral health awareness, patient expectations and demands have increased. Due to increased aesthetic desire, it is now imperative to take pre and postoperative images to demonstrate the outcome to the patient as well as virtual planning the treatment. Dental photography, being an important form of documentation, helps the clinician to analyse their work and discuss the cases with peers. It serves as a form of "self-assessment."

Dental photography and documentation have also become vital for medicolegal purpose. As per the law, a record of any clinical procedure should be maintained for a minimum period of three years. Thus, dental photography, considered as a hobby in the past has now evolved into a necessity.

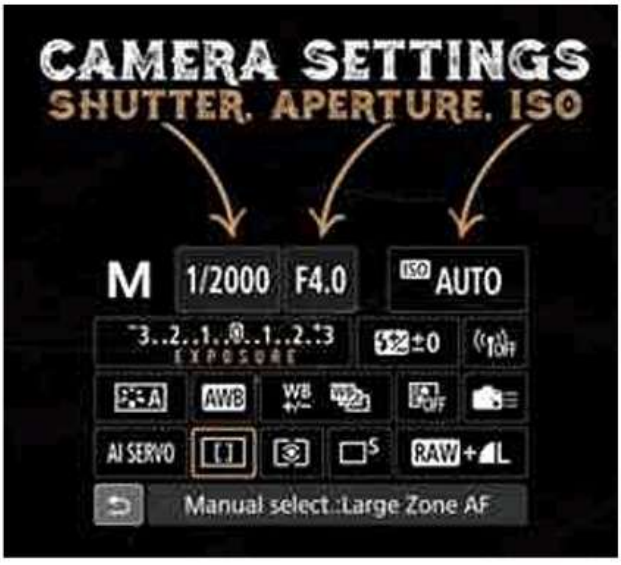
Tools for Dental Photography:

Dental photography is a combination of tools and skills. The tools for dental photography are the camera and accessories like flash, retractors, mirrors, and operator-patient position. Let's discuss each of them one by one.

The camera and its settings:

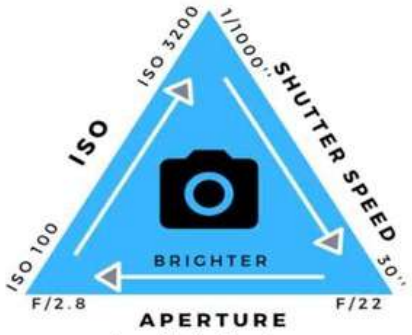
The most common question asked by anyone starting with dental photography is, "Which camera is the best?" and the simplest possible answer is, "Whatever camera you have, is best for you." It is because dental photography is more about lighting and accessories than the camera itself. Advanced mirrorless camera with WIFI facility definitely have many advantages, but for beginners, any entry level digital single lens reflex (DSLR) camera will work fine. Some entry level cameras are the Canon EOS 1500D or Nikon D3500 whic' are available in the range of INR 30,000 - 40,000.

The main purpose of using a DSLR camera is that it allows you to play around with the settings, so shooting in manual mode with manual focus is highly recommended. Manual mode might seem difficult at first, but there's a long learning curve.



Source: Lance Reis Photography for Beginners

The following image shows the relationship between ISO, aperture, and shutter speed with the brightness of the photograph.



Source: Ben goes everywhere: Shutter Speed

The basic recommendation for intraoral photography is

1. ISO (refers to the sensitivity of the camera sensor): 100
1. Shutter Speed (Exposure time): 1/100
1. Aperture (Amount of light that enters the camera) /f stop: f 22

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1. Shutter Speed (Exposure time): 1/100
1. Aperture (Amount of light that enters the camera) /f stop: f6-f8

Images in RAW format are preferred by certain journals and dental photographic competitions. The RAW format basically means that the image has not been edited.

Accessories

1. Lens

Whenever we buy a camera, the most common lens we get along with is an 18-55mm lens. All of us have heard "100mm Macro-lens" is the best for for dental photography, but these advanced lenses are expensive. Here is a simple alternative to saving money at present and invest in a macro lens later. You can buy macro filters which cost around INR 500-1000/-.

Macro Filter for camera

A macro lens filter is a cost-effective alternative to an expensive macro lens. Macro filters are easily available online in sets of 4 filters i.e., +1, +2, +4, +10 (Figure 1), which can be used individually or in combination. For dental photography, usually a + 1 size works well. The macro filters are attached to the camera directly.

Figure 1: Macro filter: A set of four filters.

Macro filters are available in various diameters, which correspond to the diameter of the lens, starting at 49mm. The commonly used 18-55mm lens has a diameter of 58mm (written at the top of the lens: Figure 2), so a macro filter of 58mm fits.

Figure 2: 18-55 mm lens having a diameter of 58 mm written at the top of the lens

If you cannot find a macro filter according to your lens size, you can get step-up or step-down rings, which cost around INR 500-700. For example, a macro filter with a diameter of 52 mm can be attached to the lens of 58 mm using step-down rings. (Figure 3)

Figure 3: Step down rings

Now let's see the practical utility of these macro filter through the following images:

1. Figure 4: Image shot with an 18-55 mm lens with standard settings and maxi mum magnification
2. Figure. 5: After attaching the macro lens filter, keeping all other settings constant.
3. Figure 6(A)When an image taken with an 18-55 mm lens was cropped, it led to haziness in the image and loss of clarity.
4. Figure 6(B) When the same image was taken after attaching a macro filter, leading to a better depth of field and clarity.

Figure 4: Image shot with an 18-55 mm lens

Figure 5: Image taken with a macro lens filter lens and the same settings as in Figure 4.

Figure 6 (A): Cropped image of figure 1.
Notice the loss of details and haziness on the cervical aspect.

Figure 6 (B): Image shot with a macro lens filter, better clarity and depth of field.

2. Lighting

a. In-built flash

In the initial days, you can use the in-built flash of the camera. The flash lights, if directly used, are very harsh, so it is recommended to use a diffuser. For the simplest form of diffuser, you can cover the flash with a thin tissue paper. For a more professional look, you can buy a diffuser online, which costs around 100 INR. Figures 7(A) and 7(B) depict the difference created after using a diffuser.

Figure 7 (A): Image shot using an in-built flash without diffuser.

Figure 7 (B): Image shot using an in-built flash with diffuser.

b. External lighting

An external flash light is the best investment one could make for better photography. Various forms of external light sources are ring flash, twin flash, and studio lights (in order of cost and feasibility). Ring LED lights and bulbs are continuous low-intensity light sources, as opposed to a flash, which throws high-intensity light on the subject for a short

time. In dental photography, since the aperture is narrow so it needs plenty of light, which can only be provided by a flash.

Ring Flash

Twin Flash

Studio Lights

3. Retractors

The most common types of cheek retractors are u-shaped, c-shaped, y-shaped, and winged retractor. For students, winged retractors serve better because they are self-retaining and do not need an assistant for holding (Figure 11).

Apart from the basic set of plastic retractors, using metal retractors is recommended. While taking anterior shots, lips tend to collapse, leading to a blocked view of the attached gingiva (Figure 12), along with winged retractors, helps to further displace the lips (Figure 13,14).

Fig. 11 Winged Retractor

Fig. 12 Sternberg Retractor

Fig. 13: Without Sternberg retractor

Fig. 14: With Sternberg retractor

4. Mirror

Mirrors are available in various forms. It is preferred to use stainless steel mirrors for dental photography. A common problem of fogging can be avoided by spraying air through the 3-way syringe or antifog solutions.

5. Positioning of the operator and patient

Dental photography and documentation are usually considered to be four-handed dentistry. But sometimes when help is not nearby, we need to learn to manage things on our own. For this, the operator should stand behind the patient at the 12 o'clock position with the patient position being almost parallel to the ground.

So, the following image (Figure 15), describes the way how it can be done by one person alone.

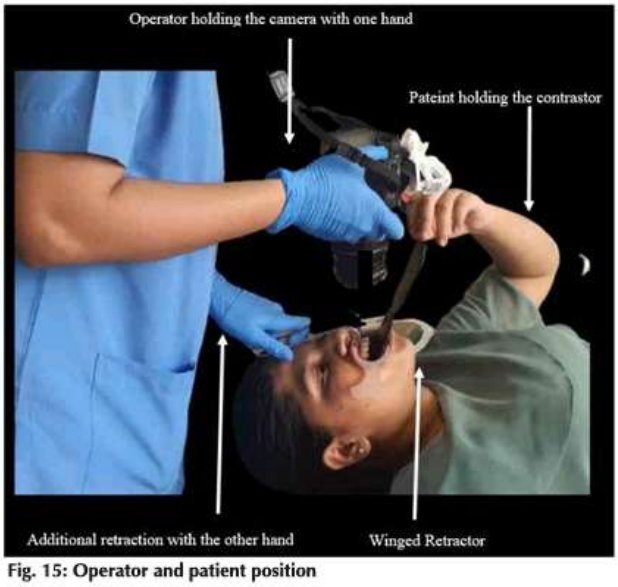


Fig. 15: Operator and patient position

6. Basic Intraoral and Extraoral Photographs

Now that we know our camera and accessories, we are all set to start our dental photography and documentation. The following images (figure 16 & figure 17) describes the basic photographs to be taken for documentation.

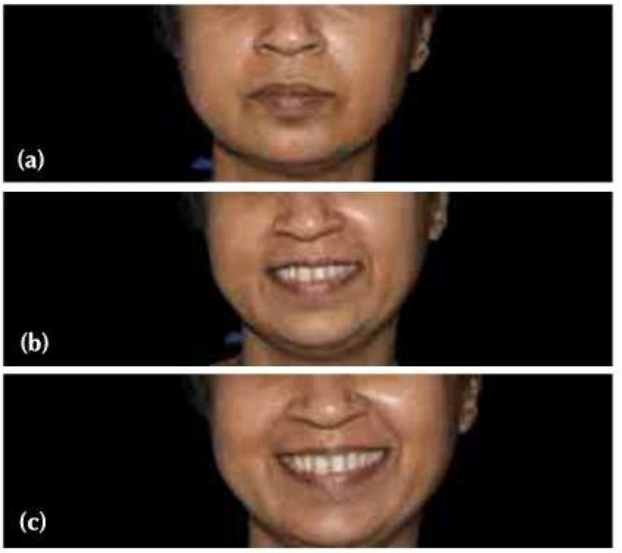
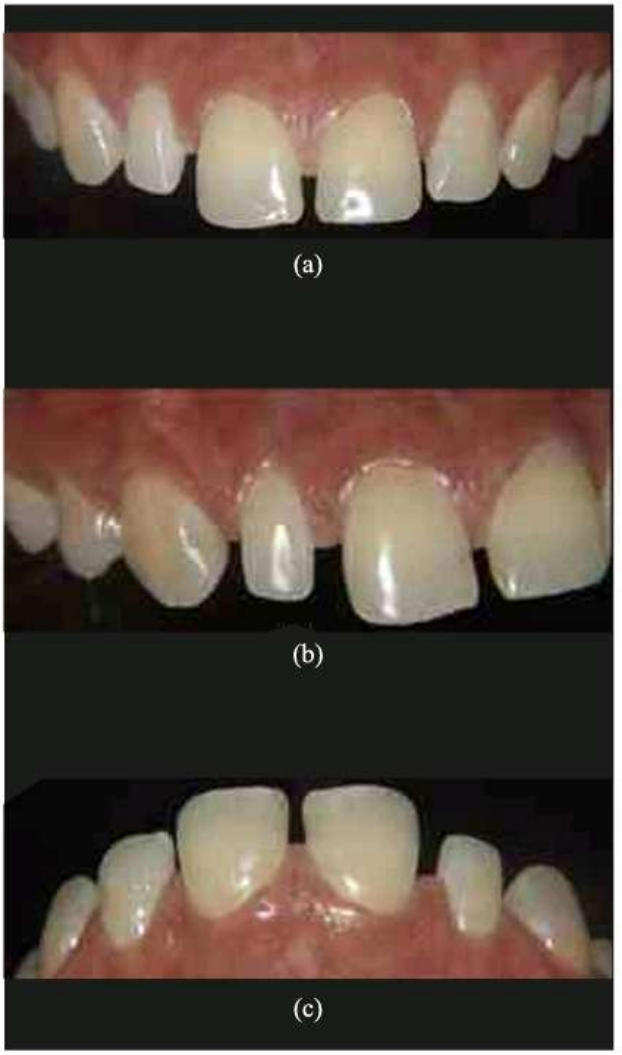


Fig. 16 Extraoral Images:
(a) Profile image at rest,
(b) Casual smile,
(c) Full smile.



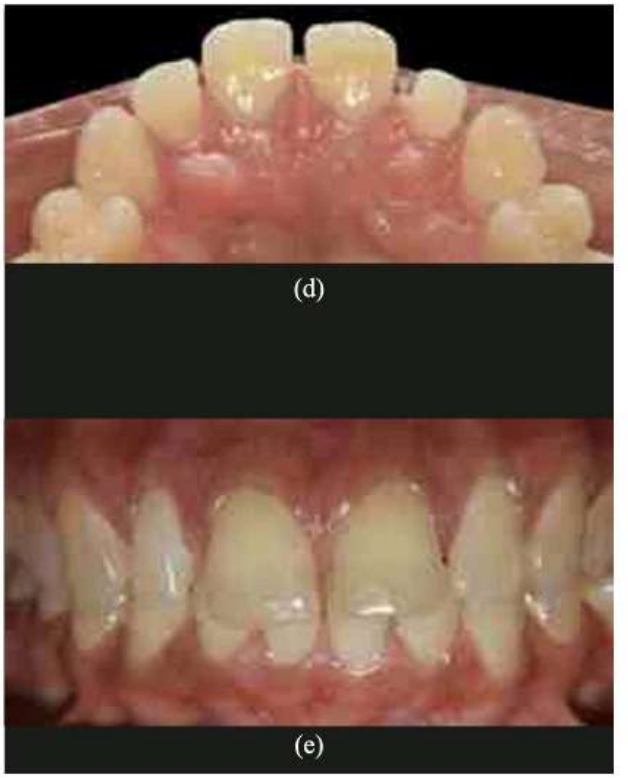


Fig. 17 Intraoral images: (a)Frontal View
(b)Lateral view
(c) 12 o'clock view
(d) Palatal & Occlusal view
(e) Frontal view in occlusion

Conclusion:

Just like dentistry, dental photography has a slow learning curve. Excellence in this form of art can be achieved only through consistent and steady practice. Keep clicking and keep documenting because "a picture is worth a thousand words."

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