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REVIEW ARTICLE **OPEN ACCESS**

Photography in Orthodontics – A Review Article

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ABSTRACT
Clinical photography has evolved over the past several years to become an essential tool and prerequisite for accurate clinical diagnosis, treatment planning, and case documenting in orthodontics and dentistry in general. The broad acceptance of popular digital photography a little more than ten years ago, together with a greater focus on smile esthetics and general facial harmony - particularly in orthodontics - have all greatly expanded its relevance to everyday practice. This article will provide a general overview of the importance of clinical photography in routine orthodontic practice, accessories used for the photography and the various views for photography in orthodontics.
Keywords: Photography, esthetics, facial harmony, orthodontics, clinical photography

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INTRODUCTION

Photographs are the very important part of all the healthcare systems especially for orthodontists for documentation and communication through visual information. With the use of photographs orthodontist can assess the existing patient`s soft tissues properly and treatment planning can be done. Morphology and tonicity of lips, type of smile arc and facial profile, amount of visibility of incisor on smiling can be assessed with the use of photographs.[1-2] The increased growth of importance of these kind of records for medico-legal reasons and presentation for lectures has made photography a important method for documentation. Extraoral and intraoral photos are a part of orthodontic clinical documentation[3] A qualified medical photographer, orthodontist, or dental assistant may take orthodontic clinical pictures[4]For taking orthodontic clinical photos, a DSLR (digital single-lens reflex) camera with a 100 mm macro lens and macro ring flash is presently the industry standard. Some dentists could decide not to utilise a DSLR camera and its lenses due to the expensive price tag and bulky nature of the equipment and they prefer smartphones for photography [5-6].

NEED FOR CLINICAL PHOTOGRAPHS

1. Clinical Records

Photographs are invaluable tool for the orthodontist for treatment planning and to record the malocclusion. Photography does not just help to know about the teeth relationship but also shows the health of supporting hard and soft tissue structures. Comparisons between images obtained in a consistent manner over the course of treatment can be made, highlighting the precise alterations that have taken place in that time. In order to have meaningful conversations with patients and their parents about the precise amount of improvement made during treatment, it is crucial to thoroughly document the initial clinical state [7].

2. To Communicate With the General Dentist

Sometimes there might be a confusion for which tooth to extract, in that time photographs can be printed and given to the general dentist in busy clinical practice. This can prevent a big mistake to happen.

3. Communication with the Patient And Parent

When an orthodontist asks the patient to wear intraoral elastics, sometimes patient doesn`t know how to wear those elastics. In that case orthodontist can provide a photo of arrangement of elastics to the patient. So that patient can use the photograph and arrange elastics properly [8].

4. Photographs as a learning tool

Photographs should be taken whenever the patient visits the clinic and before and after of the every stage of treatment. Before beginning any treatment, it is frequently beneficial for students to take pictures of the patient to evaluate the results of the previous treatment interventions. Once the therapy for that visit is over, the images can be taken to re-start the cycle. The pupil will benefit if the number of photography phases is increased [9].

5. Medico-legal requirements

Having excellent clinical photos on hand gives you a very helpful record from which you may learn a lot of information. The courts will be able to make the proper choice and grant the patients the proper levels of compensation thanks to these pictures, which will give them the data they need.

6. Photogrpahic system and accessories (fig 1)

For therapeutic usage, there is no ideal photographic system. Many operators would find it more convenient to utilize a compact digital camera that can take "snapshots," as they are simple to handle and operate. The issue with many of these compact cameras is that they lack a lens/flash combination that can capture intra-oral photos of the highest quality in a format that allows for comparison across time points. The professional single lens camera fitted with macrolens and flash light are quiet heavy and takes some time for the clinician to hold the camera in one and retract the tissues with the other hand. The mirror of the camera should be autoclavable also [10]. A front-surfaced rhodium mirror is the first of the accessories needed to provide high-quality clinical photos. This should preferably feature a long handle to offer the photographer complete control over the mirror position and to ensure that the operator's hands are far from the field of view. It is essential to have a front-surfaced rhodium mirror to avoid the double pictures caused by using a rear-coated mirror, which causes a "ghost" reflection on the mirror's front glass surface (Fig 2). It's crucial to choose dental retractors that are the right size and shape for photography in order to produce high-quality images. To utilise the correct retractor in the proper way, assistants must receive training. The larger end of the retractor is used to achieve vertical retraction of soft tissues on the front intraoral pictures.

FIGURE1. DSLR Camera, ring flash and macrolens

Figure2. Retractors and Photographic Mirror

Instead of their natural desire to pull back towards themselves, the retractor must be dragged forward and toward the photographer. For occlusal photography, the tiny end of the smaller retractor must always be used. When utilised properly, this will enable the lips, soft tissues to be pulled up laterally as well as forward, creating an oral mucosa backdrop against which the teeth can stand out. To improve this skill, practise is necessary with the person performing the retraction.[11]The patient may be instructed to

hold onto the mirror handle for a brief period of time while the camera is zoomed out somewhat and the aperture is changed (from F32 to F20) for the occlusal photos.

INTRAORAL PHOTOGRAPHY

1. Frontal photogrphs

Firstly, make sure patient is sitting in upright position with properly oriented face. Cheeks and lips well retracted with properly sized retractors. Make sure that the patient is biting in centric occlusion. Standardized working distance and manual focus are employed. There should be an equal display of posterior dentition on both sides. The focus is produced by rotating the camera back and forth until sharp focus is reached on the canines to maximize the depth of field and provide a sharp image from incisors to molars.

2. Right and left buccal

From central incisors to the distal surface of second molars need to be captured. Two different size retractors are used – smaller and bigger. In the anterior view, the complete ipsilateral maxillary central incisor should be visible. The occlusal plane must be levelled and the distance must be maintained. To avoid distortion or parallax error, the lens is positioned as perpendicularly to the buccal surfaces of the back teeth as possible. The gingiva should be fully exposed.

3. Occlusal views

Include symmetrical images of the top and lower occlusal surfaces. To avoid fogging, it is preferable to warm the mirrors in lukewarm water and let them air dry before inserting them into the mouth.

4. Upper occlusal

Head of the patient is tilted back by asking the patient to look at the ceiling. The patient can hold the mirror while the assistant, preferably using two segmented cheek retractors, pulls up the lips to reveal all teeth, from the incisors to the second molars. The mid-palatal raphae is in the centre. Frame with a full arch and little soft tissue on display.

5. Lower occlusal

From the distal to the second molars, the mirror is positioned at an angle outward and downward pull on the lips. The tongue could be lowered or pulled back behind the mirror. The bottom of the frame is parallel to the labial surface of the central incisor. The midline should be centered in the frame [12].

FACIAL PHOTOGRAPHY

Frontal view aids in determining significant asymmetries and disparities in the transverse and vertical planes. During exposure, the camera must be positioned so that it is perpendicular to the midline of the face. The patient is looking directly into the camera with open eyes. The ears are totally visible. The patient is asked to remove any jewellery or spectacles that might be distracting. The tip of the nose serves as the approximate frame's centre. The patient is made to sit in natural head position and straight upright with both the ears visible equally and their lips at rest or smiling as needed, and their eyes squarely into the lens against a white matte background. In profile view, the head should be pointed to Frankfort's horizontal plane, the ears should be exposed, the face should be turned to the right, the lips should be relaxed, and the entire head and neck should be visible (Fig 3).In three-quarter or oblique view, make sure that half of the upper lid eyelashes show. Orthodontic records are taken in following views:

Figure 3.(A) Frontal view with lips at rest. (B) Frontal view with smile. (C) Profile view with lips at rest. (D) Three-quarter view with lips at rest. (E) Three-quarter view with smile.

CONCLUSION

Photography is one of the most important aid for the documentation and in the treatment planning of any orthodontic case. It is also a useful method for learning and teaching purpose. The clinician cannot just know about the teeth relationship to each other but can also evaluate the soft and hard tissue relations. Photographs can be taken every time whenever the patient visits the clinic and the results after the treatment can be assessed. Clinician can see the amount of tooth movement happened after the placement of any wire and can do the corrections if needed.

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