

# Recent Developments in Clinical Photography

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**Abstract:** A system comprising a clinical camera, specialized retractors, and a new occlusal mirror are described to maximize the quality of both intra-oral and extra-oral photography in the multi-user situation.

## Introduction

Most orthodontists need clinical slides either for lecture or demonstration purposes at some point in their career, and the use of pre- and post-treatment photographs as an invaluable clinical aid is on the increase. Trainee orthodontists often need the best quality records on the first batch of patients they see as these will be the ones that they present to the examiners a couple of years later in their M.Orth. exams. Obtaining high quality intra-oral photographs is a goal that often evades even the most enthusiastic hospital photographers.

## Recommended photographic system

Kyocera Yashica are to be congratulated for their new model Dental Eye III (Fig. 1), which contains many improvements over the Dental Eye II, which itself was a very popular camera in medical and dental circles. The first obvious improvement is the fact that the camera is smaller and substantially lighter than its predecessor.

It is essential that the person taking the photographs also holds the retractor on the side being photographed in buccal views to optimize the angle, whilst maximizing retraction and the quality of the result. One minor complaint when using the Dental Eye II was the weight of the camera, in that it was sometimes quite an effort for the photographer to also hold the cheek retractors. With the new, lightweight Dental Eye, this is much less of a problem (Fig. 2).

The beauty of the Dental Eye, particularly in a multi-user situation, is the fact that few adjustments are required during use. A drawback of its predecessor was the fact that the exposure compensation switch (only required for mirror shots) was placed underneath the lens and thus was obscured from the direct field of view of the photographer or assistant. On the Dental Eye III, the aperture control is placed on top of the camera body, and thus is directly viewable by the photographer and assistant, both of whom can check whether it has been activated or not.

An LCD panel, which is accessible and easy to read, is provided on top of the camera giving an indication of the number of frames that have been used (Fig. 3). A hot shoe has been provided on top of the camera body to allow accessory lighting to be added to the system, although this

has not proved to be necessary during any routine intra- or extra-oral dental photography.

An improved motor drive has been added to the camera, which now automatically rewinds the film at the end of the roll. Unlike many cameras, the film can also be rewound mid-film, rather than waiting until the final frame. The motor drive also has a far smoother and quieter action than its predecessor.



FIG. 1 Kyocera Yashica's Dental Eye III.



FIG. 2 Lightweight camera easier to hold 'one-handed'.

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FIG. 3 LCD and aperture control easy to read.

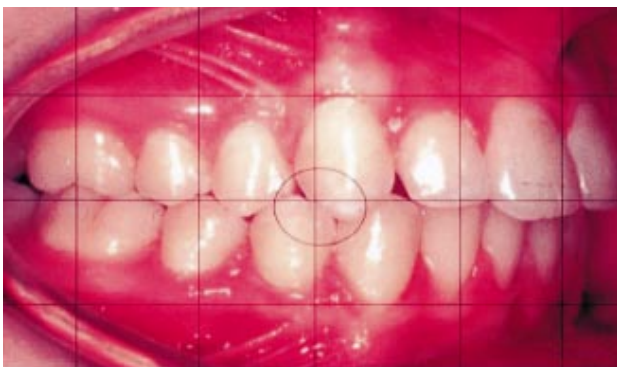
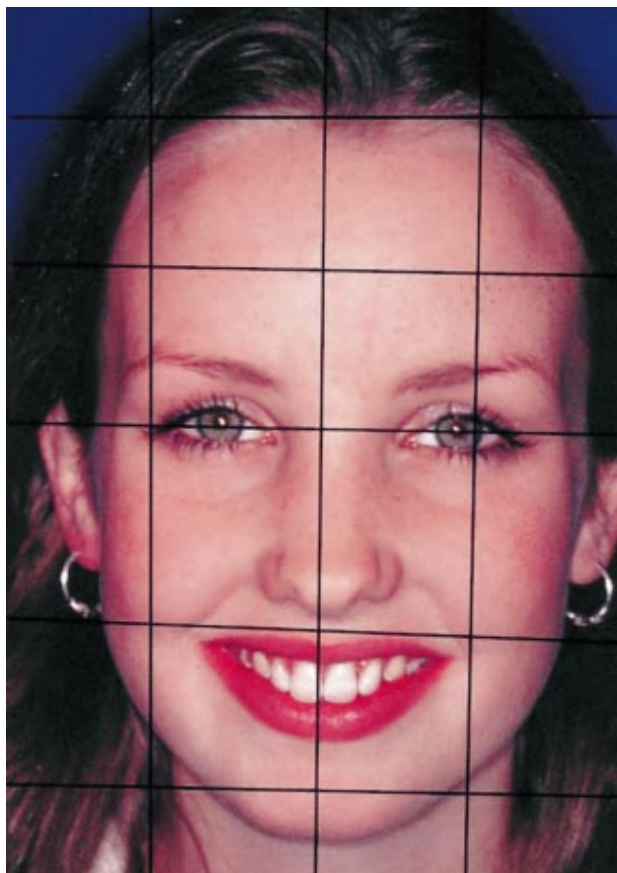


FIG. 4 Graticule ensures perfect construction of extra and intra-oral photos.

By far the most significant improvement which will dramatically improve the reliability of camera positioning are the changes now seen through the viewfinder. The focusing system has been altered from a split prism to a ground glass system, which improves ease of focusing.

The line across the middle of the viewfinder during intra-oral photography should, in most cases, be coincident with occlusal plane and the shot should be symmetrically composed. The frequently seen tilted occlusal planes on photographs taken by novice photographers should be a thing of the past. With extra-oral shots, lines can be placed parallel to the inter-pupillary line on the front shot, or to the Frankfort plane on the side and three-quarter view to give reproducibility between the shots (Fig. 4).

Availability of the 2× multiplier will also allow close-up shots to illustrate particular clinical problems or techniques (Fig. 5). It must be remembered that the depth of field is only a few millimetres when using the multiplier. Therefore, an intra-oral rest is often required to ensure the area of interest is in focus (Fig. 6).

Another very useful addition to any clinical photographer's armamentarium is a long-handled occlusal mirror. The reflective surface of the larger mirror is perfectly shaped to maximize the amount of arch that can be photo-

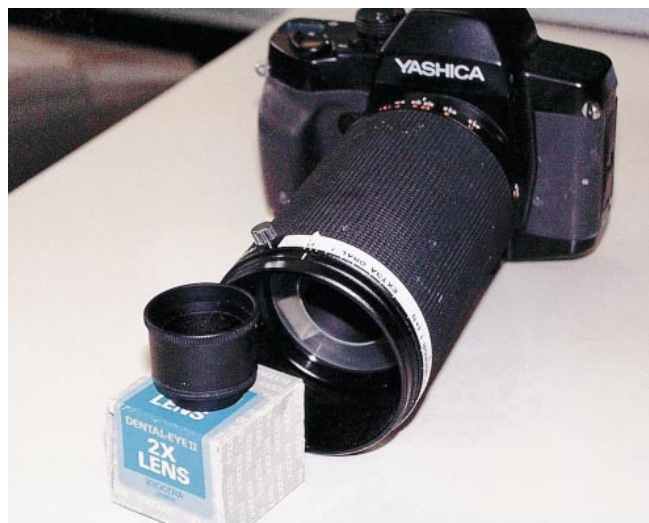
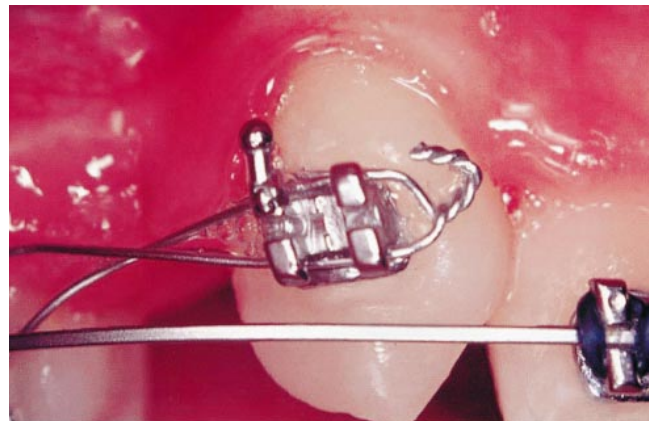


FIG. 5 Twice life size image possible with 2× multiplier.

graphed and it can be used in all but the smallest patients (Fig. 7). The smaller version is useful for patients with particularly small mouths or those in the deciduous dentition.

The beauty of the long handle is that the photographer can control the composition of the photograph by holding the end of the long handle and manipulating the mirror



FIG. 6 Finger rest required to ensure shot in focus.



FIG. 7 Long handled mirror manipulated easily for best view.



FIG. 8 Mirror handles keep fingers out of the frame.

position with ease. Subtle adjustments can be made at the moment before the photograph is taken to include those illusive 2nd or 3rd molars or tilt the mirror by a few degrees to achieve perfect symmetry. Occasionally, where necessary, the patient can also be recruited to help hold the mirror, a situation which proved difficult with the smaller mirrors as the patients and often assistants' fingers invariably crept into the frame (Fig. 8).

The final piece of equipment, which contributes greatly to the overall quality of the final intra-oral photographs, is the retractors. Self-supporting retractors rarely, if ever, allow satisfactory retraction of the lips and cheeks. Two sizes of retractors are required and the assistants need careful training in the use of these retractors (Fig. 9). For front views the large end of the larger retractor is used in 95 per cent of patients. The assistant must learn to pull the retractors forwards towards the photographer to maximize retraction.

The photographer must hold the retractor on the side being photographed when buccal shots are being taken. The large retractor is merely turned through 180 degrees to utilize its' smaller end which provides less vertical, but much more horizontal retraction. The photographer can ensure maximum distal pull immediately before the shutter is activated, thus maximizing the angle to as near perpendicular to the molar premolar area as possible. This will then allow true representation of the buccal segments sagittal discrepancy and also ensure that the distal surface of the first molars is included in the frame (Fig. 10).

Occlusal photographs are perhaps the most difficult views to take to a consistently high standard. Once again, the person doing the retraction probably has the most difficult job and should be encouraged to use the correct retractor, i.e. the small end of the smaller of the two retractors, which should be pulled laterally and vertically, as well as away from the teeth. The photographer has control of the mirror and encourages the patient to 'open about twice as wide' at the last second to ensure maximum access (see Fig. 7).



FIG. 9 Specific retractors for quality results.



FIG. 10 True sagittal relationship of 6s seen.

### Summary

The Dental Eye III when used with the retractors detailed above and this new occlusal mirror is recommended for all budding clinical photographers. The camera is, without doubt, a most effective and reliable system to produce high standard intra- and extra-oral photographs in every clinical situation.

The Dental Eye III is available from: Haley, St George's Road, Semington, Trowbridge, Wiltshire, BA14 6JQ (Tel: 01380 870820). The long-handled mirror is Mirror C—large for occlusal photographs—and can be obtained from: Filtrop AG, Schlossweg 24, FL-9496 Balzers, Liechtenstein (Tel: ++75 388 11 50-53). The retractors are available from American Orthodontics, Riverside House, Mill Road, Marlow, Bucks, SL7 1PX Item no. 852763 (large) and 852764 (small)