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Clinical Photography in an Orthodontic Practice Environment Part 1

Abstract: Clinical photography has become an invaluable patient record over the past 20 years. With the advent of digital photography it is cheap and easy to produce very high quality records of each and every clinical situation. This is an irreplaceable technique in the teaching and learning environment and is the perfect tool in a busy orthodontic practice. Using modern software, stored photographs are easily accessible and instantly transferable between clinicians anywhere on the globe. Quality photographs will help inform debate about clinical issues.

Clinical Relevance: The first part of this two-part article will discuss the merits of taking clinical photographs and the benefits of high quality pictures to the clinicians as well as the patients. The second part will describe contemporary photographic equipment and the many essential accessory products, as well as how best to store the images. In addition, 'Top Tips' will be proposed to allow the best possible results to be reliably achieved.

Ortho Update 2010; 3: 70-75

Why we need clinical photographs

Baseline clinical records

A full set of clinical photographs, if taken to a high standard, is an invaluable record detailing the original clinical situation before any treatment has started. These should be a mandatory record for each and every patient we diagnose and plan for treatment, even if the treatment is only extraction of teeth to intercept or simplify the developing malocclusion. Photographs allow us to record not only the relationship of the teeth to their adjacent numbers and their opponents, but also the health of the hard and soft tissues.

When photographs are taken using a standardized method, comparisons can be drawn throughout treatment detailing the specific changes that have occurred during the intervening period. The changes seen are the direct results of our ministrations, combined with the normal growth and development occurring during

that time period.

It is essential to document the original clinical situation fully so that, at any stage, meaningful discussions can be entered into, with both the patients and, in the case of children, their parents, as to the specific amount of progress that has occurred during treatment. Memories can be inaccurate and both patients and parents soon forget the original arrangement of the teeth. It is only by reference to the original photographs that they can appreciate the changes that have occurred during treatment.

If removal of any deciduous or permanent teeth is being recommended, it is only by having photographs of the original situation, as well as the models and radiographs, that the full benefits of interceptive extractions can be appreciated (Figure 1a-e).

This record will also prove to be helpful should a dispute arise at a later date, an occurrence that sadly appears to be happening with increasing frequency.

To aid communication with the general dental practitioner

In some clinical situations there can be confusion as to specifically which teeth are recommended for extraction. This may occur where there are supernumerary teeth, such as five lower incisors, or where supplemental lateral incisors have formed. Clinical photographs and radiographs can be printed out within seconds, to be given to the patient or sent to the GDP. Clear markings on the photograph can avoid mistakes in a 'busy' dental practice (Figure 2a, b).

If early dental decay in posterior teeth is suspected, which is highlighted on the OPT, it is always extremely helpful to the practitioner to indicate exactly where the suspected problem lies. Again, within seconds, a picture can be printed in the clinic to allow the patient to share with the GDP the areas causing concern (Figure 3). This printout of the clinical photos, in

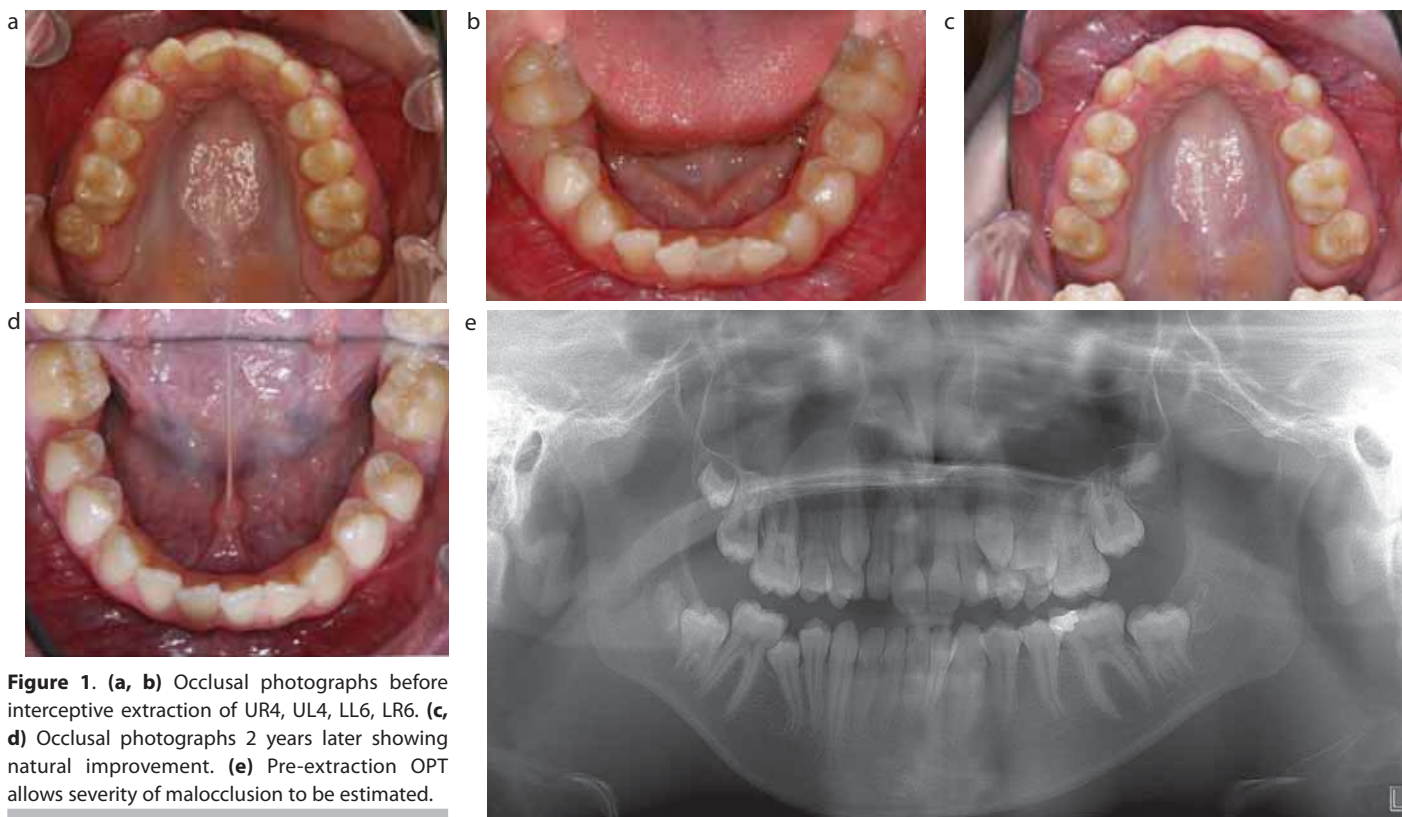


Figure 1. (a, b) Occlusal photographs before interceptive extraction of UR4, UL4, LL6, LR6. (c, d) Occlusal photographs 2 years later showing natural improvement. (e) Pre-extraction OPT allows severity of malocclusion to be estimated.

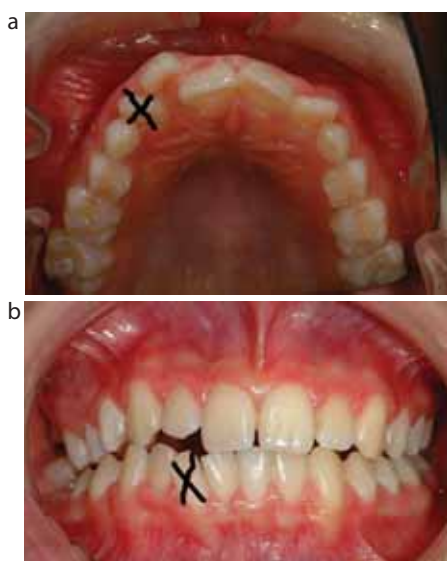


Figure 2. (a, b) Tooth to be extracted marked on photograph so no possibility of errors.



Figure 3. Unsupported probe sticking in upper left molar indicating need for intervention.

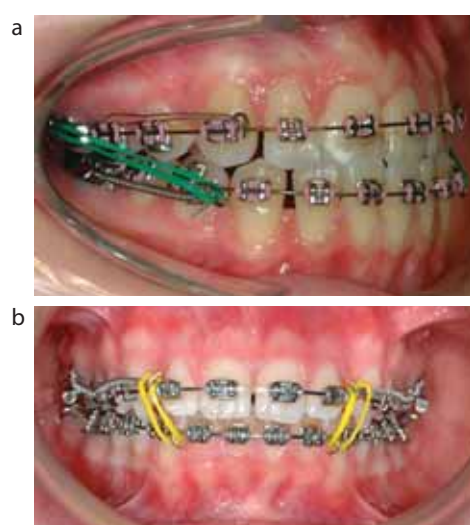


Figure 4. (a) Patients can clearly see where to apply the intra-oral elastics. (b) In the absence of photos misunderstandings can occur.

addition to prints of a digital radiograph of the suspect lesions, can help the GDP enormously in planning his/her treatment.

To aid communication with the patient and parents

When asking a patient to use a combination of intra-oral elastics during treatment, it is helpful to print out a photo of the arrangement of elastics and give it to the patient. Using this photograph, the patient should be able to copy the

arrangement prescribed exactly (Figures 4a, b).

Photographs as a teaching tool

The clinical photograph has no equal as a tool for teaching orthodontic techniques. Ideally, in a teaching situation, clinical photographs should be taken on a visit-by-visit basis and these photographs should be displayed on a monitor at the chairside and referred to at every patient visit. It is only when both the teacher



Figure 5. Chairside photographs on every patient are the 'Gold standard'.

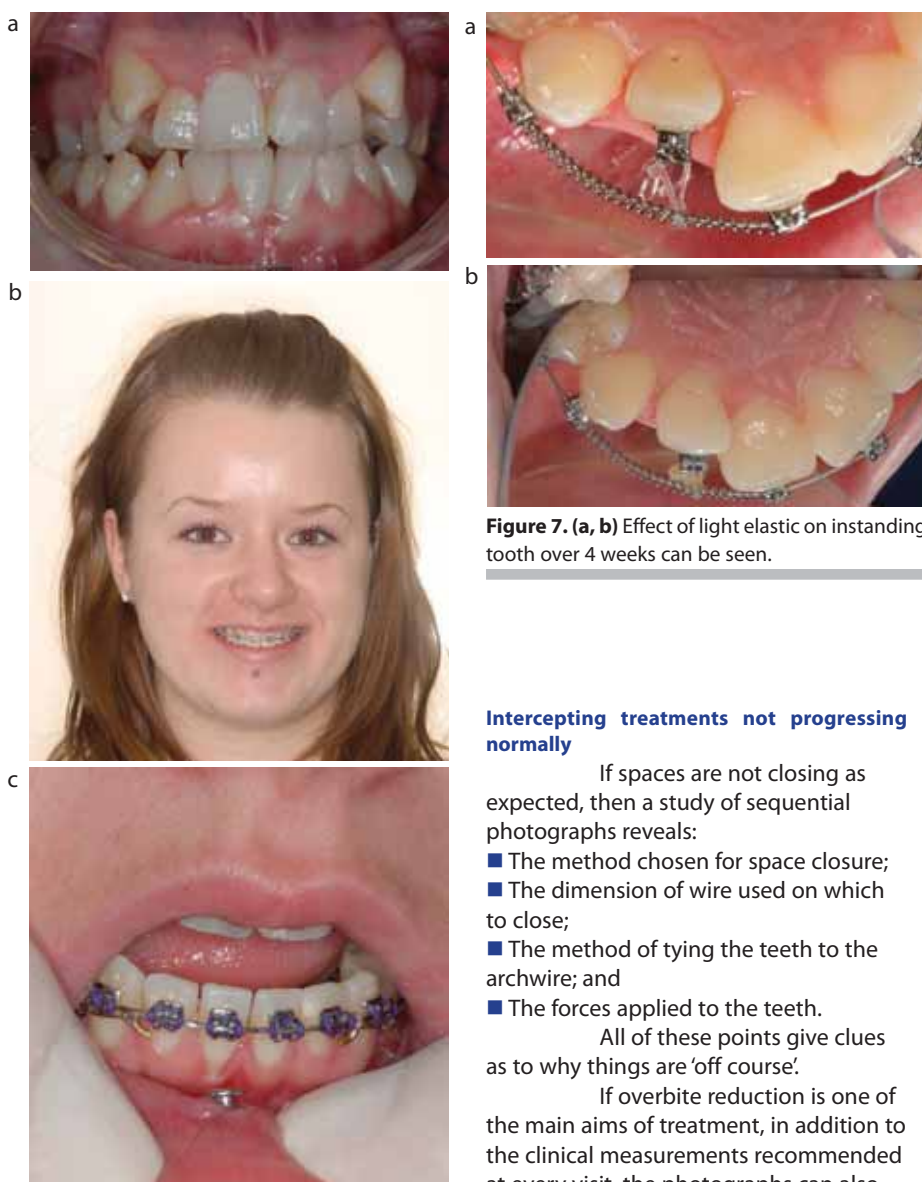


Figure 6. (a) Pre-treatment photograph shows healthy gingival margins with no recession. (b) Patient has had a lip piercing. (c) Recession directly related to the position of the lip stud.

the student can see how the teeth were specifically positioned, four to six weeks previously, that they will be certain whether the specific intervention recommended was the most appropriate treatment (Figure 5).

It is often helpful for students to take photographs of the patient before any treatment is actually done, to assess the effects of the last treatment ministrations. The photos can then be taken when the treatment for that visit is complete to start the cycle again. Maximizing the number of photographic stages will help the student profit from the learning experience at each and every visit.



Figure 7. (a, b) Effect of light elastic on instanding tooth over 4 weeks can be seen.

Intercepting treatments not progressing normally

If spaces are not closing as expected, then a study of sequential photographs reveals:

- The method chosen for space closure;
- The dimension of wire used on which to close;
- The method of tying the teeth to the archwire; and
- The forces applied to the teeth.

All of these points give clues as to why things are 'off course'.

If overbite reduction is one of the main aims of treatment, in addition to the clinical measurements recommended at every visit, the photographs can also give clues as to the speed and efficiency of the particular treatment approach. In cases where there is scant regard to routinely taking clinical measurements and photographs, orthodontic cases can often drag on beyond the second year into a third and even a fourth year of treatment.

If the hard tissues or soft tissues are victims of detrimental pressures, it is also of great benefit to document this and issue any necessary advice before unfounded accusations are made. The fact that a lip stud had led to marked gingival recession could only be demonstrated to the patient by comparing before and after photos of the affected area (Figure 6a-c).

The second set of photographs may be required when new mechanics are introduced to a patient, so that the student can subsequently witness the direct effects of this latest

intervention (Figure 7a, b).

It is still essential to make routine clinical measurements on a visit-by-visit basis and formally record these clinical measurements on a measurement sheet within the notes (Figure 8). If there is little or no tooth movement in any particular clinical case, it is only with reference to these sequential photographs that potential reasons for this lack of progress can be identified.

To maximize the learning experience for trainees

When orthodontic trainees are developing their skills they need to review all the cases under their clinical care regularly. They need to recognize not only which cases are going particularly well and identify potential exam cases, but equally important is to identify the cases that are going badly. The beauty of orthodontics is that the reason for every effect of treatment can usually be discovered after careful examination of the clinical records. Sequential photographs throughout treatment, perhaps on a six-weekly basis, is an invaluable teaching and learning aid and the trainee will soon appreciate the benefits of a particular clinical approach, compared with other approaches, which produce less convincing results.

It is also of benefit to trainees to take detailed photographs of when things are going wrong during treatment, or when particular appliance systems break (Figure 9 a-c). This will act as further reinforcement for the student and the teacher as to the most and least efficient and effective methods of providing treatment.

Trainees need to identify cases for their final presentation. It is only by regularly taking photographs of all of their patients that they will end up with a decent pool of patients from which they will choose potential examination material. It is impossible from the outset to identify the specific patients that are going to turn out well and vice versa. This therefore means that the same high standard of photography must be carried out for each patient.

Medico-legal requirements

Whilst 20 years ago it was virtually unheard of for the doctor or dentist to be sued, the 'litigation culture' has, regrettably, finally reached the United Kingdom. Twenty-three years ago a seminal moment in the authors' careers was to go to the 'Bennett and McLaughlin' Straight Wire Course in London. At this course Richard McLaughlin presented his Californian patient consent form, which

STRAIGHT WIRE RECORD SHEET

NAME: Emily S. 12/28 Patient Ref No.

Date	18/5/05	17/05									
Overjet (tooth#) (mm)	2.5	5.0									
Overbite (mm)	2	4									
Centreline (mm)	-1/2	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Reverse Overjet (mm)											
I-C Width (mm)											
Upper											
Lower											
Canine Relationship											
Left	1/4 II	1/4 II									
Right	1/4 III	1/4 I									
I-M Width (mm)											
Upper											
Lower											
Molar Relationship											
Left	1/4 II										
Right	I										
Spaces (mm)	8/1 2/2	6.5/2 8.5/2	-1	-1	-1	-1	-1	-1	-1	-1	-1
Archwire	?										
Elastics	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
E.O.T. requested/worn											
Photos											
Oral Hygiene (1 - 10) 1 = poor, 10 = fantastic		4.									
Comments	+										

Figure 8. In addition clinical measurement sheets are essential.



Figure 9. (a-c) Problems arising with a particular clinical technique can be amply demonstrated.

consisted of four pages of A4 single-spaced consent for clinical treatment. If, today, you search in google for 'dh nhs organisation consent form 1'; you will see a not dissimilar four page document (Figure 10).

Sadly, in the intervening 23 years, the United Kingdom has turned into the USA and the 'compensation culture' has finally reached these shores. It is absolutely imperative these days to spend a significant amount of time explaining treatment to the patients, warning them of all the things that could possibly go wrong during a course of orthodontic treatment. You must also write in the notes that the consent has

been taken, detailing on the consent sheet specific items that have been discussed. In addition to the written consent form, clinical photographs provide an accurate record of the initial clinical situation, and there can never be any argument as to how severe the original malocclusion was, or what changes have occurred through treatment.

Communication with the courts

With the burgeoning increase in the number of legal cases, all of us will be asked at some point to provide an 'Expert Witness' report. Indeed, both of

the authors report that they have done more medico-legal work in the last three years than the preceding 23 years. Lawyers are encouraging patients to sue if they feel they are 'the victim of medical negligence' and there is only ever going to be an increase in this practice.

Possessing high quality clinical photographs provides an extremely useful record from which a great deal of information can be gained. These photographs will provide the courts with the information they require to make the appropriate decisions and award the appropriate levels of

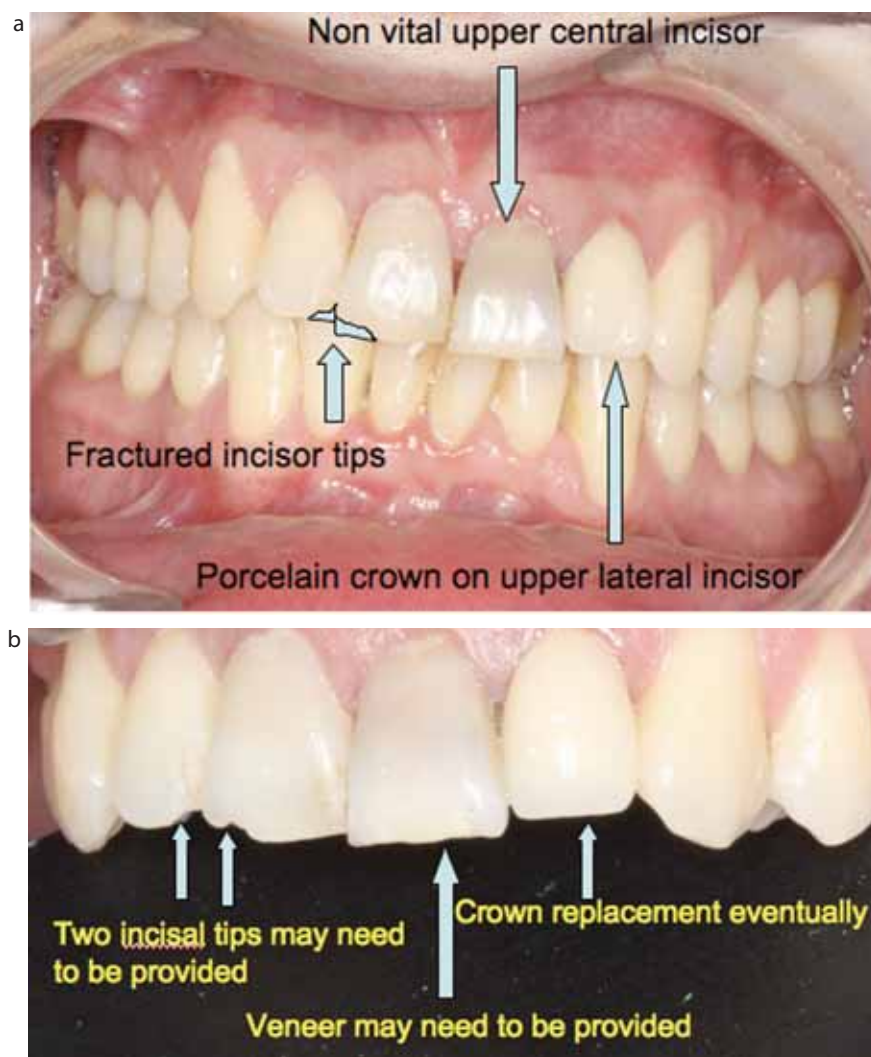


Figure 11. (a, b) Annotated photographs help lay people understand the issues.



Figure 12. Damage to the teeth during treatment should be documented.

compensation to the patients.

The most helpful tool in many of these legal reports, to allow non clinicians to understand the nature and the extent of the clinical problems, is the inclusion of high quality annotated clinical photographs (Figure 11a, b). This will easily allow all the parties associated with the case to appreciate fully the magnitude of the aesthetic detriment to the injured party, which should lead to a swifter settlement, which has to be in most people's best interest.

Pre-existing condition recorded accurately

If there are any initial problems with the teeth from the outset, these can be recorded accurately on the clinical photographs. Examples of this could be any cracks within the enamel, fractures of incisal edges and demineralization.

At the end of the course of treatment, if there have been any detrimental effects on the teeth, it is also useful to record this photographically and to discuss this in some detail with the patient and record the discussion in the clinical notes. This would particularly apply to areas of demineralization or any damage to the tooth surface that has occurred or worsened as a result of treatment (Figure 12). It is useful to discuss all the options with the patient, his/her parents and the general dental practitioner and once again record that all options have been discussed.

Conclusions

This first section has described the benefit of taking photographs and the uses to which they can be put. The next section will give practical information about how to obtain the high quality results to which we all aspire.

CPD Answers for April 2010
1. A
2. C
3. C
4. A, C, D
5. A, B, D
6. A, B, C
7. B, C D