

Responsibilities and Retention

Abstract

As our understanding of orthodontic relapse has improved, there is an increasing move toward long-term retention. Safely reducing relapse using appropriate long-term retention imposes considerable responsibilities on the orthodontist, the patient, and the patient's general dentist. This article will describe these responsibilities.

Keywords: Relapse, responsibility, retention, stability

Introduction

Preventing relapse is the greatest challenge in orthodontics. Unwanted posttreatment changes in tooth position and occlusion can compromise the result of any orthodontic treatment, so reducing relapse is key for any orthodontic patient. Safely reducing relapse using appropriate retention imposes responsibilities on the orthodontist, the patient, and the patient's general dentist. This article will give an overview of these responsibilities.

Why Do Patients Need Retention?

Most long-term studies have indicated that without retainers, teeth will relapse in the long term.^[1-3] While some degree of relapse seems to be a consistent finding in most studies, the amount and nature of relapse are unpredictable. Even patients who have never had orthodontic treatment tend to show long-term changes in tooth position, typically leading to an increase in irregularity, particularly in the lower labial segment.^[4] To try and understand why relapse is so unpredictable, it would be helpful to understand the causes of relapse.

Causes of Posttreatment Changes

Unwanted posttreatment changes could be relapse as a direct result of the orthodontic treatment but they may also be due to normal physiological factors that could be regarded as normal age changes.^[5,6]

Orthodontic factors causing posttreatment changes include periodontal and gingival

forces; impact of the occlusion; and soft tissue pressures and the limits of the dentition.

When teeth are moved, it takes some time for the fibers around the teeth to remodel; particularly, the elastin fibers within the interdental and dentogingival fibers.^[7] This is particularly a problem with rotated teeth. Orthodontists can overcome this by ensuring the teeth are held in the correct position for long enough for the fibers to remodel, or by cutting these fibers around the neck of the teeth using a technique known as pericision or circumferential supracrestal fiberotomy.^[8] The final occlusion is also important in terms of stability, as any displacing contacts or abnormal loading may lead to unwanted tooth movement. The orthodontist can therefore reduce relapse by aiming for a well interdigitated occlusion without gross occlusal interferences. The orthodontist is also able to control the position of the teeth in relation to the surrounding soft tissues and respecting the limits of the dentition. The teeth lie in an area of balance with the lips and cheeks on one side and the tongue on the other. The further teeth are moved either labially or palatally, the more likely it is that they will be subjected to soft tissue pressures, which may overpower the periodontium and lead to relapse. This is more complex than it sounds, as it is not known how far the teeth can be moved before relapse begins to occur, and this may differ between different patients.

Physiological factors that cause relapse may be regarded as normal age changes that occur for any patient. These probably include subtle, ongoing long-term growth

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changes in the facial region, and possibly as a result of natural mesial drift of the dentition. The teeth are therefore in an environment that is always changing, and as a result will always be at risk of minor positional changes.

Implication of Long-term Risk of Relapse

It is clear that relapse is a risk for most patients. It is not true to say that all patients will relapse. The classic work from the University of Washington in Seattle^[2,3] showed that when patients wore the retainers for only 1–2 years after orthodontic treatment, 70% of them had a serious need for treatment 10 years later. These results are clearly disappointing but could be viewed in another way – despite not wearing retainers long-term, 30% of patients showed some degree of stability after 10 years. The challenge for orthodontists is that we do not have a method of predictably identifying those patients who will relapse and those that will remain stable. We therefore have to presume that everyone has the potential to relapse. As a result, most orthodontists now recommend long-term retention, either in the form of fixed (bonded) retainers or long-term wear of removable retainers. Patients are often advised that they should wear their retainers for as long as they want to keep their teeth stable.

The implication of the long-term risk of relapse is therefore the need for long-term wear of retainers. This long-term commitment brings significant responsibilities for the orthodontist, the patient, and the patient's general dentist. These responsibilities should not be underestimated and will now be discussed in more detail.

Responsibilities of the Orthodontist

Informing patient of need for retention

Before patients decide whether to proceed with orthodontic treatment, they need to give their informed consent. The process of informed consent requires patients to understand the options for treatment, including no treatment at all, as well as appreciating the risks and benefits involved.^[9] It is incumbent on the clinician to determine what is important for each particular patient, and tailor the consent process appropriately, so the patient understands the commitment that is needed to get the best result, while minimizing the risks. Orthodontic treatment is a big commitment for any patient, and it could be argued that for most orthodontic patients, the aspect that requires the largest commitment is the need to wear and maintain retainers in the long term. Previous research has shown that for some patients, this commitment to wear retainers is more of a burden than the actual treatment itself.^[10,11]

If retention is not going to be successful, should we proceed?

If the patient is unwilling, or unable to wear retainers long term, then it may be sensible for a responsible orthodontist

to decline treatment. All clinicians have to balance up the benefits against the risks of any medical or dental intervention. In many cases, if the patient is not willing or able to commit to retainers in the long term, then the benefits of treatment may be lost due to relapse. It may therefore be more appropriate not to start treatment. In addition to the risks of treatment, the treatment costs should also be considered. Depending on the healthcare system where the patient is having treatment, these costs may be borne by the government, an insurance company or the patient (or patient's family). It may be difficult to justify these costs if the benefits of treatment could be lost without long-term retention.

Choosing the appropriate retainer for the patient

Choosing the appropriate approach to retention for each particular patient should be evidence-based. But what do we mean by "evidence-based"?

Evidence-based medicine has been described as "the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients"^[12] and involves considering the following:

- Best research evidence
- Clinical expertise
- Patient values, expectations, and circumstances.

Keeping up to date with the best research evidence is challenge for all clinicians. It is the responsibility of every clinician to ensure they make themselves familiar with the best contemporary high-quality evidence. A recent Cochrane review looking at orthodontic retention was unable to identify enough high-quality evidence to recommend one particular retainer type over another.^[13] The review concluded "there is moderate quality of evidence from research looking at whether thermoplastic retainers should be worn full-time or part-time." It is beyond the scope of this article to provide a full overview of the best contemporary research evidence into retention, but the interested reader is referred to another article that summarizes where we currently are with evidence-based retention, and how the busy clinician can apply this knowledge to their own clinical practice.^[14] It is vital that the clinician takes responsibility for finding out what patients are expecting from their retention and understand the patient's personal circumstances; hence, an appropriate choice of retainer and retention regime can be tailored for each individual patient.

Informing patient how to minimize risks of wearing retainers

No interventional treatment is without risks, and retainers are no exception. Fixed retainers have been shown to increase plaque and calculus retention, as well as changing the bacteriological load in the mouth, increasing the numbers of bacteria capable of causing periodontal disease and caries.^[15,16] However, provided good oral hygiene is

maintained, it would appear that these patients are not at risk at progressing with actual clinical disease.^[17,18] The responsibility for the clinician is to firstly ensure that they choose a patient who is capable of maintaining excellent oral hygiene around the fixed retainer, and secondly, to ensure the patient understands the risks if this oral hygiene is not maintained.

There is also increasing evidence to suggest that occasionally unwanted and potentially damaging tooth movement can occur even with the bonded retainers in place as a result of some activity in the bonded retainer wire.^[19-21] It is therefore vital that bonded retainers are monitored on a regular basis. The need for maintenance is discussed a little later in the article.

Removable retainers are not without risks either. The main reason for the failure of retention with removable retainers is a lack of compliance, with patients having to remember to wear their retainers. There is also evidence of isolated cases of severe enamel damage as a result of patients drinking cariogenic drinks while wearing vacuum-formed retainers.^[22]

Make appropriate arrangements for long-term maintenance of retainers

As our understanding of relapse has increased over the years, the amount of time we have asked our patients to wear retainers has increased. As mentioned earlier, due to the unpredictability of relapse, many clinicians now suggest patients wear their retainers for as long as they want straight teeth (which may mean forever). This shift in advice brings its own challenges. Many of the same retainers that were originally designed to be worn for 1–2 years are now being prescribed for patients to wear for many years. The materials will deteriorate with time, so arrangements need to be put in place for who should monitor, repair, and replace these retainers in the long term. It is the orthodontist's responsibility to make these arrangements.

There is no universally agreed approach of who should take responsibility for reviewing and maintaining retainers in the longer term. One approach is to ask the patient's general dentist to take over this role. This is controversial and will be discussed in more detail later on, in the section of responsibility of the patient's dentist. If the dentist is going to look after the retainers long term, it is the orthodontist's responsibility to inform the dentist about the details of retention and what is required in terms of maintenance. The information that needs to be passed onto the dentist includes

- When orthodontic treatment was completed
- Planned retention protocol
- How long the orthodontist will review the retainers for
- What problems to look out for and how to address them when they occur

- How to look after the retainers
- Follow-up care for retainers
- Full details of the types of retainers that have been fitted.

Ensure patient understands costs of long-term maintenance of retainers

Long-term maintenance of retainers will have inherent costs. These costs may involve the cost of the retainer review visits and also any costs for retainers that need replacing or repairing. It is the orthodontist's responsibility to ensure the patient is made aware of these long-term costs before they commit to treatment.

Responsibilities of the Patient

The orthodontist will explain all the risks and benefits of the retention protocol and make clear the implications and risks to the patient if this advice is not followed. Once the patient has signed up to this plan, it is then their responsibility to ensure they follow these instructions and commit to long-term wear of the retainers, as prescribed by the orthodontist. It is also important that they realize that it is their responsibility to follow all the advice on how to look after and maintain their retainers to reduce the risk of compromising oral health. While patients are wearing retainers, it is vital they are checked regularly to ensure there is no sign of health problems and to decide if the retainer is still successfully retaining the teeth and whether it needs replacing. The orthodontist will advise who is best to look after the retainers long term, and once this is agreed, the patient must take responsibility to ensure they arrange and attend these maintenance visits. They should seek advice if they envisage any problems paying for or accessing these regular retainer checks.

Responsibilities of the Patient's General Dentist

This article has so far discussed the responsibilities of the orthodontist and the patient in retention. More controversial however is the role of the patient's general dentist. As has been discussed earlier, as our understanding about posttreatment changes has improved, there has been a recognition that retainers need to be worn in the long term to reduce the chances of relapse. Previously, when retainers were prescribed for a shorter period, it would have been possible for the orthodontist to monitor them. However, with long term, possibly indefinite wear, it has been suggested that it would be better for the patient's dentist, as part of their normal dental checkups, to review retainers. While this seems a sensible and pragmatic approach, this does have implications for the dentist and is not universally popular with dentists at the present time. In recent surveys into dentist's attitudes toward monitoring retention, less than 50% of dentists in the UK were comfortable with this^[23] and only 66% of dentists in Switzerland.^[24]

There are implications for the dentists of taking over long-term maintenance of retention in terms of time,

remuneration, skills, and knowledge. These factors need to be addressed if this is going to work successfully in the future. It could be argued that there is a responsibility for the orthodontic specialty societies and general dental profession in each country to work together to determine the best way to make this work for patients. It may be necessary to improve training for dentists about the maintenance, placement, repair, and monitoring of retainers, not just at postgraduate level but also at the undergraduate level.

If the appropriate training and remuneration system were in place, it would be helpful for general dentists to take responsibility for:

- Detecting failed bonded retainers and repairing and replacing them as required
- Monitor the fit of removable retainers and replacing them as required
- Provide motivation to patients to wear and look after their retainers appropriately
- Monitor the effect of retainers on the patient's oral health and intercepting any problems.

Conclusions

1. The need for long-term retention brings considerable responsibilities for the orthodontist, patient, and the patient's dentist
2. The orthodontist has the responsibility to: inform the patient of the need for retainers as part of the consent process; consider not proceeding with treatment if the patient is unwilling or unable to wear retainers; choose a retention regime appropriate for each individual patient; provide advice about how to minimize risks caused by the retainers; and make arrangements for their long-term maintenance, informing the patient of any costs involved
3. The patient has the responsibility to follow the prescribed retention protocol, including how often to wear the retainers and ensuring they look after them as advised to minimize risks. The patient also has to take responsibility for arranging regular checks of the retainers for as long as they are wearing them, to make sure they are maintained in a condition that ensures they are successfully reducing relapse and are safe.

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Conflicts of interest

There are no conflicts of interest.

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