Importance of radiography in dental treatments

By Dr Ellie Nadian

Periapical radiographs

A periapical radiograph is an intra-oral radiograph. Intra-oral simply means that radiograph is taken with the film inside the mouth, but the radiographic machine would be positioned outside the head. Periapical radiographs are used to view teeth, roots, apices, and surrounding bone and tissue.

Periapical means around the terminal end of a root. In other words, a periapical radiograph is taken to show the tooth from the crown of the tooth to the tip of the root. Periapical radiographic films are available in three sizes. We use Size 0 for children and Size 2 for examining anterior and posterior teeth in most adults.

Bitewing radiographs

A bitewing is an intra-oral radiograph that is taken to examine the crowns of both maxillary and mandibular teeth. Bitewing radiographs are used to show the spaces between the teeth. They are used to locate cavities on the interproximal surfaces of the teeth and thus do not provide an image of much of the surrounding tissue. In simple words, the main intent of the bitewing is to detect caries between the teeth. The dental bitewing is also a useful tool for detecting periodontal conditions and bone levels between teeth. It can be used to detect changes in bone density due to periodontal disease. Bitewing radiographic graphs can also be used for the detection of calcium build-up. A bitewing film has a tap attached to the film. That tap is known as the wing of the film and the patient bites on that wing to hold the film inside the mouth.

Bitewings can reveal:
- interproximal caries at early stages;
- small cavities;
- secondary caries under fillings;
- the outline of fillings;
- previous treatments under fillings;
- and bone loss in the early stages of periodontal disease.

Panoramic radiograph

A dental panoramic radiograph may be used as a preliminary survey of a patient’s teeth. A panoramic radiograph provides a panoramic view of the jaws. It allows visualisation of all dental arch and adjacent regions with only one radiograph exposure.

The panoramic radiograph is the most-often used extra-oral radiograph in dentistry, however, it has limitations for conservative dentistry because the quality of the image is not adequate to detect early carious lesions. Therefore, a panoramic radiograph is used for initial oral examination and may not eliminate the need for intra-oral radiographs. Sometimes, a dentist may need a combination of a panoramic radiograph and follow-up intra-oral radiographs. A panoramic radiograph is not a substitute for intra-oral radiographs, but a supplement. However, some dentists find panoramic radiographs to be more child-friendly because there is no need to place a film in the mouth of an anxious child.

CBCT

CBCT machines are designed to provide 3-D visualisation of dental tissue at relatively low radiation doses. A CBCT machine can also reconstruct a panoramic image, sparing the patient the exposure for a panoramic radiograph.

Some CBCT machines can reconstruct bitewing and periapical radiographs as well; however, the current dose of CBCT machines does not support use of CBCT for routine and standard caries detection. CBCT may be used for assessment and planning prior to a complex dental surgery or when routine examination and standard radiographic images are inconclusive for the detection of a vertical root fracture. For more information regarding indications for CBCT, readers are directed to Nicholas Drage’s paper “Cone beam computed tomography (CBCT) in general dental practice”.

Currently, we are referring our panoramic radiograph and CBCT patients out; however, we are studying our options to purchase a CBCT/panoramic radiograph machine. Our dentists provide emergency dental services in Brisbane and panoramic radiograph/CBCT services are closed after hours and over weekends. Patients who are in agonising pain from an abscessed third molar on a Friday night suffer with having to wait until Monday for a panoramic radiograph or CBCT scan. We believe we would be able to provide them with better services when we acquire a CBCT machine.