

June 2010

Implant

DENTISTRY TODAY

Rob Pittack

Is peri-implantitis a ticking time bomb?

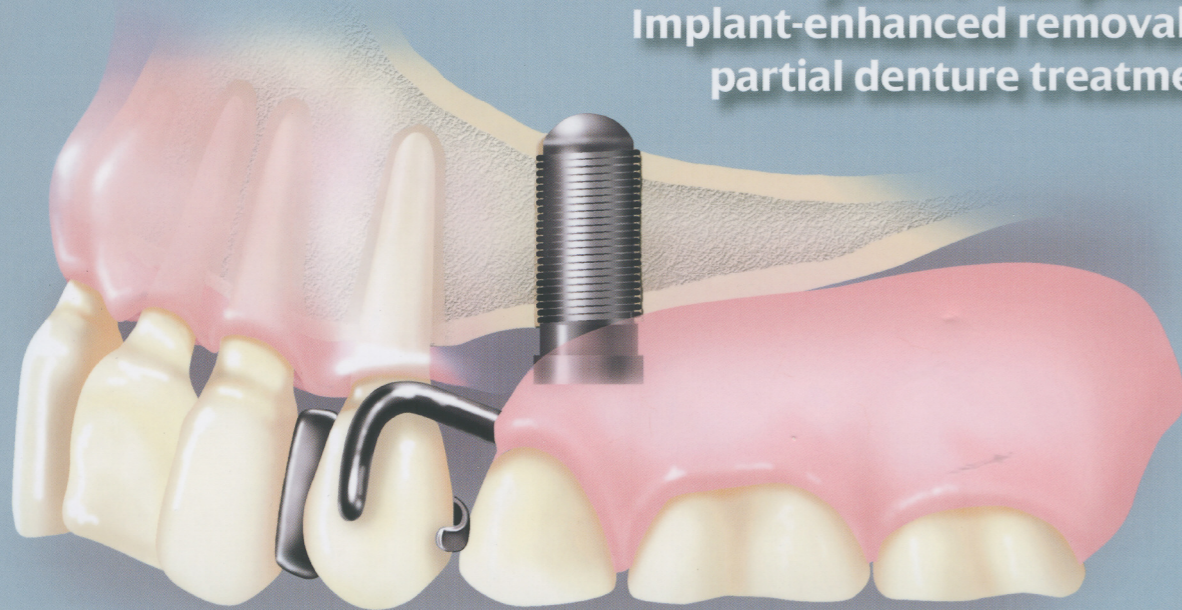
Simon Wright

A critical review of the evidence on radiological assessment of bone quality

Robin Warne

CAD/CAM screw-retained solutions

John F Carpenter
Implant-enhanced removable partial denture treatment



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Dentistry in the third dimension

Nilesh Parmar explains the benefits of three-dimensional imaging when it comes to diagnosis and treatment

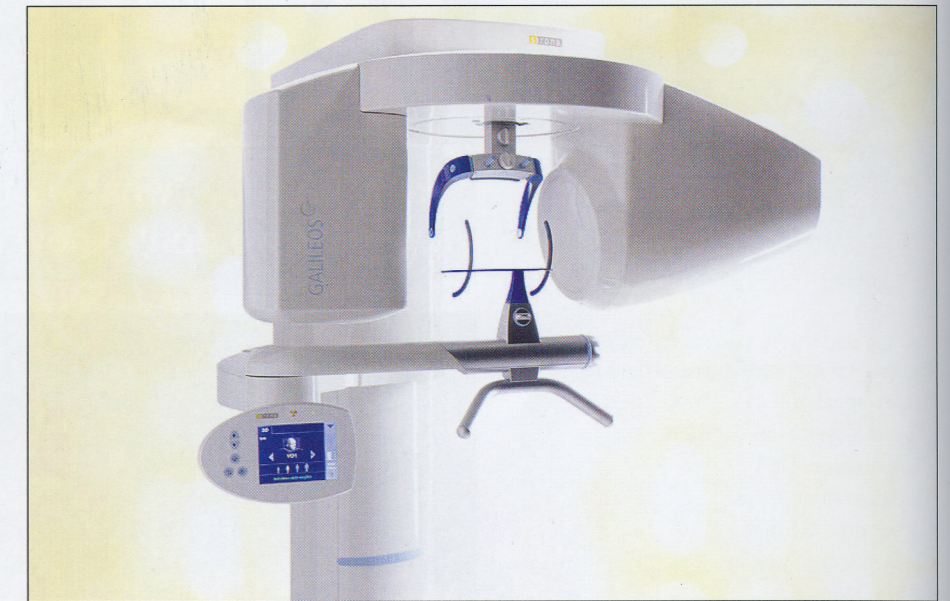
One of the expressions that I always remember from dental school was spoken to me by a very wise professor. He said: 'A radiographic image is a two-dimensional representation of a three-dimensional object'.

That phrase has stuck with me and has always cast doubt on all the grey, black and white smudges I have seen on every bitewing, periapical and OPG since I qualified. Clinical dentistry is very much a three-dimensional environment, so why have we all spent so long putting up with two-dimensional imaging?

There are a few reasons why. Firstly, a lot of clinicians will tell you that we simply have not needed 3D imaging in general dental practice. Clinicians can and should be able to reach a diagnosis based not only on the 2D plain film radiographic evidence but also from each patient's symptoms, clinical examination and history.

Secondly, previously, machines that provided 3D images were large, costly and exposed the patient to a large dose of radiation. The resulting images were, at best, difficult to interpret and required specialist operators to use and interpret the scans. These made them unsuitable for general dental practice and more suited to hospital-based institutions where the necessary infrastructure was available.

With the recent increases in demand for implant treatment, clinicians require a more sophisticated imaging protocol for implant



therapy pre-operative planning. This has led to the development of smaller and cheaper CBCT machines that are able to produce detailed images of the jaws, coupled with a reduced radiation dosage to the patient.

In late 2009 we purchased a Sirona Galileos CBCT machine to aid patient diagnosis and treatment planning, primarily focusing on dental implant applications. Currently, there are several types of machines available in the UK, all with their pros and cons.

The Galileos stood out for us because it uses an image intensifier screen that allows for a much-reduced radiation dose to patients. A study by Ludlow et al (2006) showed the Galileos default scan exposure to be 29µSv, while the classic standard scan was 47µSv (ICRP 1990 calculations).

The information obtained is easily manipulated and viewed using the Galaxis software, which allows for virtual implant placement and computer-aided implant placement, and will soon allow for virtual Cerec crown placement using Cerec BlueCam scans of the dentition overlaid onto CBCT scans of the jaws. Recently, a vertical collimation has been introduced to the Galileos machine, further reducing the radiation dose.

A CBCT scan can aid diagnosis and treatment in several dental disciplines. Although its

primary use is aimed at oral surgery and implant dentistry applications, a CBCT scan can provide invaluable information for endodontic treatment, orthodontic treatment planning and periodontal diagnosis.

In one 14-second scan the Galileos machine will capture and produce a reconstituted DPT, sagittal and transgenial views of the jaws, a 3D rendering of the entire jaw and a cephalogram.

The availability of an on-site CBCT machine has fundamentally changed my implant practice. The information obtained has allowed me to be much more confident with treatment planning of larger cases, especially in the posterior mandible or maxilla where there are anatomical considerations.

The 3D rendering of the patients' jaw bones with overlaying proposed implant placement makes explaining treatment plans to patients easier and aids informed consent. **I**

For further information about the Galileos CBCT systems, contact Sirona Dental Systems Ltd; tel: 0845 071 5040; email: info@sironadental.co.uk; web: www.sirona.com