



An Occlusal Contact Baseline

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Abstract

This paper questions the veracity of occlusal contact recordings made using electronic force measuring devices. Positioning and location of occlusal contacts are questioned.

Keywords: Occlusal contact, Electronic measures, Contact location, Contact area.

It is important upon routine examination to create an occlusal contact profile. The profile includes the contact areas where the dynamics of an occluding dentition takes place. It is the individual contacts that support the jaw position and ultimately the occlusion (1). Prevention is built upon early intervention (2). Shifts in occlusal contact areas may signify change. Dentists do not record the status of occlusal contact areas in the working occlusion. Instead electronic systems are used to record and store occlusal force points which are converted into simulated occlusal contact areas (3). Force is not contact (4). Force areas which include intensity of contact/force are recorded on a universal grid which is arch shaped and includes areas that signify teeth (5). Closing force data is measured from a 60 to 100 micron thick plastic wafer which contains numerous receptors (6). The wafer impedes full closure because it is relatively thick and semi pliant. Locations of actual tooth contacts may not be precise (7). Bilateral balance of the jaws signifies occlusal health. Electronic systems that measure force are used to record a balanced occlusion (8). The teeth in the dentitions that underlie the recording wafer must be adjusted in order to achieve bilateral balance on the wafer. Adding or subtracting surface areas from tooth structure is required. Essential occlusal contacts may be lost upon removal of surface areas (9). The damage is irreversible. This may lead to eventual bite collapse and mandibular displacement (10). Are the teeth and jaws in bilateral balance? Allayed with these devices is measurement of the speed of disclusion (11). The faster the separation of the working occlusion, as measured in milliseconds, the better the functioning occlusion? The force measuring devices have not been proven to accurately measure, locate and record occlusal contact. They measure closing forces and locate them on a universally segmented arch form that simulates occlusal contact locations. Many clinicians rely upon these electronic systems to verify their clinical results. There is no scientific information to prove that what clinicians see on the wafer is what they get without the wafer. Presently there is no way to test these systems for clinical accuracy and reliability. Clinical judgements vary. Standards are required for evaluation.

Presently there are no standards. Physicians compare blood pressure readings over time. There is a baseline. Dentists can not share occlusal contact information because there is no baseline. Permanent baseline records of occlusal contact are required to monitor occlusal health.

The figures demonstrate various means to monitor occlusal contact.



Figure 1. A blue contact paper records occlusal contact areas. The paper may add extra contact markings that are false. The results cannot be saved.

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- **Accura I** Dmetec, South Korea –
5 years since inception – 256 Relative Occlusal Force Levels in 0.01 secs/frame
- **IOS Scanners (Many)** – Optically scan occlusal morphology with all teeth out of contact
No Relative Occlusal Force Levels; no Timing except ModJaw
- **Innobyte** Kube Innovations, Canada –
4 Years since inception – Reports Absolute Force in Newtons (N); no Timing

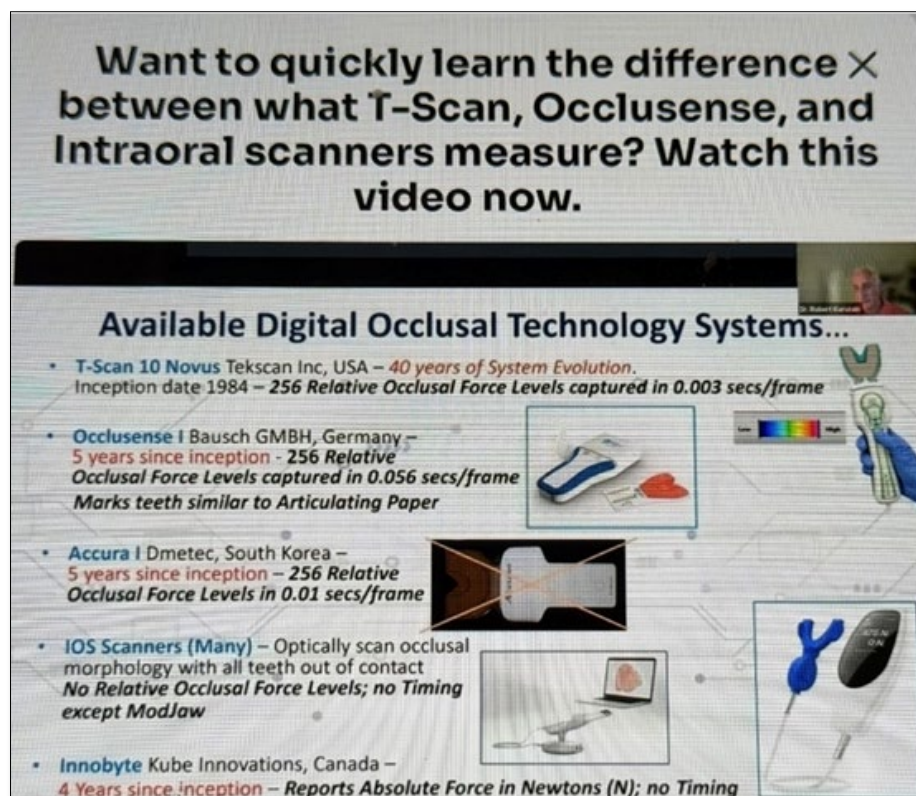


Figure 2. Several electronic force measuring systems are advertised. Accuracy of the systems is assured but how they convert measurements to accurately locate occlusal contact areas is unknown.

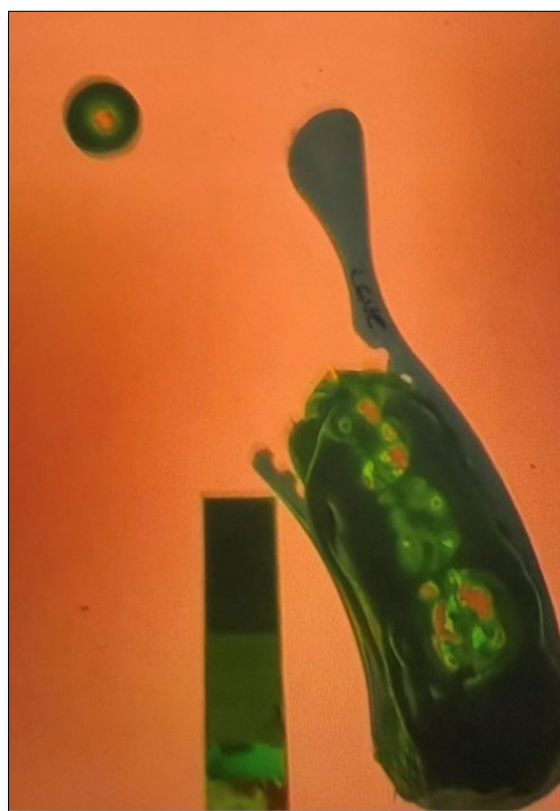


Figure 3. An Easy Scan print (Sabrosa) is taken from a triple tray impression which is placed on a light box and photographed. Image analysis is used to measure the emitted light on the print and to direct the assigned color red to occlusal contact areas. Nearby areas can be made visible using different colors. The impression is simple to take. The image is simple to make. The procedure is inexpensive and the image can be stored for further reference.

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