

[Critical analysis of leakage studies in endodontics]

[Article in French]

[De Bruyne MA](#), [Verhelst PC](#), [De Moor RJ](#).

Universite de Gand, Departement de Medecine Dentaire & Clinique de Medecine Dentaire, Stomatologie et Chirurgie maxillo-faciale, Service de Dentisterie Operatoire et d'Endodontie, UZ Gent - De Pintelaan 185 (P8), B-9000 Gand.

Incomplete filling of the root canal is one of the major causes of endodontic failure. Endodontic filling techniques and materials which perfectly seal the canal are essential for the success of endodontic treatment. Different in vitro tests are being used to test the sealing efficiency of endodontic filling techniques and materials. A large amount of these tests are leakage tests which measure the penetration of a tracer along the root canal filling. Tracers mainly are dyes, radio-isotopes, bacteria, bacterial metabolites, fungi and others. Apart from the tracer penetration techniques there are also other techniques. The electrochemical technique measures electrical current passing through the void along the root canal filling. The fluid transport method evaluates through-and-through voids along the canal filling. With this technique pressure on the water at the coronal side of the root canal filling is increased. In case of leakage, this will be registered based on the movement of an air bubble in a capillary attached to the end of the root. All of the described methods have their limitations. The largest limitations are the low reproducibility of some of the methods and the absence of standardization. Capillary flow porometry, a method well-known from the industry, has recently been applied in dentistry. With this method through pores can be evaluated in a standardised and reproducible way. Voids which do not extend along the entire root canal filling still have to be evaluated with other methods. Despite of the shortcomings of the in vitro leakage tests, they remain useful as an initial screening of new materials and techniques for canal obturation.