At the end of the 70's the techniques of canal obtur-
ration which were considered correct and therefo-
re able to seal the apex together with the whole en-
dodontic system, were substantially two: warm ver-
tical compaction and cold lateral condensation of the
gutta-percha. Two techniques had created two dif-
ferent “schools” based on different biological principles:
the school of warm vertical compaction which was in
favour of the radical elimination of the organic con-
tent of the endodontic system and its substitution with
an obturation that sealed the system, the school of
cold lateral condensation which was in favour of the
organism's ability to positively manage the terminal
millimeter or millimeters (apical portion of the canal
and lateral canals) of the endodontic system.

Corollary to this different approach was (and is) the
different interpretation of an incidental overextension
beyond the apex of the obturation: not a serious acci-
dent if accompanied by a seal for the vertical suppor-
ters,1-4 “a grave error”, always considered serious by
the lateral supporters.5-9

In this context (at the end of the 70's) a new obtu-
ration technique emerged called thermo-mechanical
compaction or (with the name of the inventor) the
“McSpadden technique”. This technique depended
totally on the use of a new instrument which could
condense the gutta-percha: the McSpadden compac-
tor. This instrument had the design of an inverted
Hedstrom file, that is, with the blades turned towards
the tip instead of towards the shaft. The compactor
mounted on a 1:1 contra-angled handpiece, was inser-
ted in the canal next to a gutta-percha cone and made
to rotate at 20,000 rpm.

The heat generated as a result of the rotational fric-
tion of the instrument caused the softening of the gut-
ta-percha, which thanks to the blades of the instru-
ment, was pushed towards the apex. This allowed the
adaptation of the obturation material to the canal ana-
tomy, and the three dimensional filling and seal of
the endodontic system with gutta-percha.10-14 This te-
technique made no reference to either of the two above
mentioned biological “philosophies” since it didn’t re-
quire an “absolute” choice in this sense, even if it was
a fact, that the efficient vertical and lateral thrust of the
heated gutta-percha brought about a filling of all the
available endodontic spaces.

Maintaining the basic concept unaltered, that is
the concept of utilising a rotating instrument insi-
de the canal to introduce and condense the thermo
plasticized gutta-percha, the successive evolution of
the thermo-mechanical compaction technique uti-
lized the technical advances achieved in the endodon-
tic field: the use of NiTi alloy and the new know-
ledge regarding the physico-chemical properties to-
gether with the resulting new methods of gutta-per-
cha production.

The Multi Phase Technique15,16 is a technique that
in the early 90’s combined the principle of thermo-
mechanical compaction with the new materials; in fact
it foresees the use of an instrument similar in design
to the McSpadden compactor, but made out of Nickel
Titanium with differing tip diameters and conicity, and
of a particular gutta-percha defined as “Alpha Phase”
which is pre-plasticized and then introduced into the
canal with the rotating instrument. The distinctive cha-
racteristics of this type of gutta-percha by comparison
to the traditional ones are: a lower point of fusion, a
longer working time, less contraction during cooling
down, adherence to the tooth surfaces.17-20

The most important clinical characteristic is howe-
ever, represented by the higher fluidity: so if on the
one hand it allows a better adaptation of the material
to the endodontic irregularities with even the possi-
bility to easily fill complex canal systems,15 on the other
hand it brings about a difficult vertical control of the
obturation (Figs. 27.1-27.2).
THE MICROSEAL TECHNIQUE

To utilize the advantages of a more fluid gutta-percha and reducing the risk of overfilling, an evolution of the multi phase technique has been proposed, which maintains unaltered the advantages of this obturation method, but in which the vertical control has been improved by the use of a master cone, which acts as an apical “cork” and which is positioned and condensed inside the canal before the introduction of the thermo-plasticized gutta-percha. This method is called the “microseal technique”.

This technique utilizes cones of gutta-percha and pre-plasticised gutta-percha, both made with new generation high plasticity gutta-percha, as well as spreaders and thermo-mechanical condensers in NiTi capable of working in all the canal pathways. The presence of a master cone which engages the apex and whose physico-chemical characteristics allow integration with pre-heated gutta-percha enables a complete, but controlled filling of the endodontic space.