

What do you think about multiply described paresthesia or dysesthesia after N2 treatment?

I wrote on these topics in "Endodontie 4/1999: 323 – 336: Damage to the N. alveolaris inferior by overfilling with root canal material". I could refer to a similar article by Kockapan with his statement that the frequently reported nerve damages caused by N2 cannot be ascribed to the physical characteristics of the material but to its worldwide use. Naturally, such incidents are only published with some years' delay. Unfortunately, the use of N2 has strongly been decreasing for years, which cannot only be attributed to the statements of the

professorships but is also caused by the variety of new products. Each and every new technique and promoted root canal filling material on the healthcare market claims to offer a sophisticated procedure respectively material in the patients' and practitioners' interest. Could you ever blame your colleagues for taking hold of the new products?

Have you ever observed bone or gingival necrosis after the use of N2?

I had to diagnose a gingival necrosis only once after following Sargenti's proposal to put an N2-soaked stripe of tamponade into the gingival pocket.

Endo N2®		
Set	10 g powder, 6 g liquid	REF 152 027
Powder separate	Content: 10 g	REF 152 028
Liquid separate	Content: 6 g	REF 152 029



Publications:

Schädigung des Nervus alveolaris inferior durch überfülltes Wurzelkanalfüllmaterial.. Endodontie #4; 1999: 323-336; Endodontic treatment of primary teeth in the general dental Practice. Roots Vol 6: 2010(3): 26-30 Vital amputation of permanent teeth. Roots . 2011; 4: 10-16

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Old and proven - but not without controversy

The N2 method of Sargenti - 50 years of dental practice

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A Practitioner of Endo Technique according to Sargenti



Dr. Robert Teeuwen

- 1937 Born in Gangelt
- Studies University of Bonn, Germany
- 1965 Approbation
- 1969 Opening of dental practice
- 1994 – 9/2005 Joint practice with son
- 9/2006 Retiring from active dentistry

The N2 method was developed in the early 1950s, based on the assumption that only a gas was capable of reaching all branches of the root canal system, and named after the Swiss dentist Dr. Angelo Sargenti (1917 – 1999). The anti-septic element of the probably most famous root canal cement N2 is paraformaldehyde. During the setting stage formaldehyde is released as gas. It diffuses into the pulp and the dentin tubuli.

How did you learn about N2?

During my years of study at the University of Bonn, Germany (May 1959 – February 1965) N2 was the preferred root canal filling material of the dental clinic.

When assisting in my father's dental practice I used to work with N2 as well – occasionally replaced by Endomethasone, Riebler and Diaket.

Since when have you been familiar with the method developed by Dr. Sargenti?

I first learned about the Sargenti method in the years 1968 – 1970. This method convinced me as it is efficient and time-saving, which was very convenient for me as I had opened an own dental practice in July 1969 and never knew how to cope with the heavy patient traffic. So I was forced to think about measures to work efficiently – not only in endodontics. From April 1972 I used to work with an assistant to reduce my own workload. Naturally, this assistant worked according to my instructions. Since the day of opening of my practice all of my and the assistant's dental treatments have been recorded. All of these practice diaries do still exist, however, the patient's file cards are no longer complete. So I was able to count the number of endodontic treatments.

How many root canal treatments have you done so far?

I did 16,108 endodontic treatments with N2 in permanent teeth from 7/1969 to 12/2005. My assistants made it to 10,436 N2 endodontic treatments in the time from 04/1972 to 12/2001. For comparison: In his book "Endodontic Therapy" (5th ed. 1998), the renowned endodontist Weine reports about 18,500 endodontic treatment he had personally done.

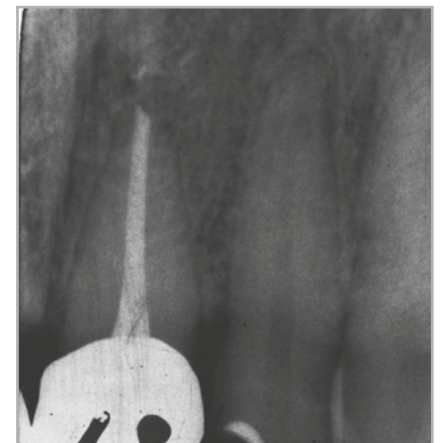
Only 22 (5 done by myself, 17 by an assistant) out of more than 8,800 computerized vital endodontic treatments between the years 1985 – 1999 required more than one appointment. I haven't counted thousands of vital amputations and endodontic treatments of deciduous teeth.

How are your experiences with these cases?

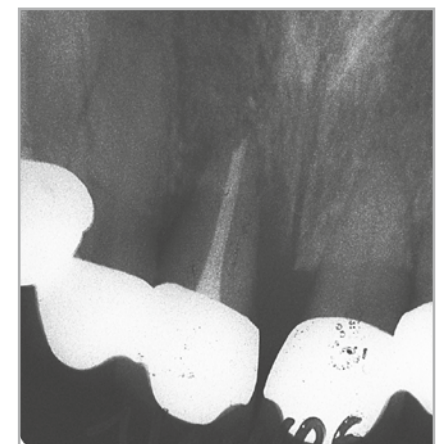
Several times I tried to treat deciduous teeth with Ca (OH)2. I judged the subsequent pain rate as being too high. It applies to all (dental) medical disciplines that the practitioner virtually loses face



1971: Tooth 11 non-vital, root canal treatment in one appointment followed by Schröder Airation



1987: X-ray control after 16 years



2006: X-ray control after 35 years

the more a patient has to see the doctor because of unsolved problems (pain after endodontic treatment, surgery, pressure marks).

How were you convinced to use N2 permanently?

If not overfilled, a vital endodontic treatment with N2 never ends up in pain, including endo treatment of deciduous teeth.

How did you get into contact with Dr. Sargenti?

I wanted to meet Dr. Sargenti on the occasion of a vacation in Switzerland in 1989. He gave me quite a short shrift at his doorstep. In the year 1990, it was Dr. Sargenti to ask me for contact. He had suffered from a stroke and was in need of help then. He knew that I had done a lot of endo treatments and due to this experience he asked me to represent the N2 method in German speaking countries. After I had studied the endodontic scientific literature, prepared a lecture in English and presented umpteen treatment cases to the AES (American Endodontic Society= professional association of N2 users in the US), Sargenti paid for my trip to an AES session in the United States, where I received the "fellowship". After presentation of yet another lecture and 150 completed cases I was bestowed the title of "mastership".

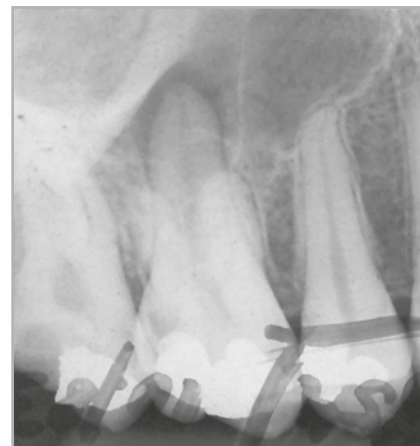
My mentioning of more than 16,000 treatments does not necessarily mean that they all met high quality standards. Root canal treatment of molars was quite in disorder. Until mid of 1985, however, X-ray control directly after root canal treatment was only done in exceptional cases. So we did not know what we were doing. Consequently, frequent failures due to poor root filling quality could be observed after years. At least this proved that the Sargenti method does not necessarily protect against failures due to poor root filling quality. In case of heavy overfilling, I prophylactically made a "Schröder Airation" (= artificial fistulation). In by far most of the cases, gangrenous teeth could also be treated in one appointment. In case of short root filling, I finished treatment by apectomy, the other teeth were treated by trephination

Whether apectomy or trephination 2 – treatment has to be done efficiently without much fumbling to avoid subsequent problems. Acute exacerbations do very rarely occur after apectomy/trephination. I occasionally treated a "via falsa" with perforation and N2 leakage into the bone successfully by fistulation as well. I use the expression "occasionally" as this happened only very rarely, thus there had been little chance to do the therapy. Basically I regard the perforation area as artificial foramen, a foramen not belonging here.

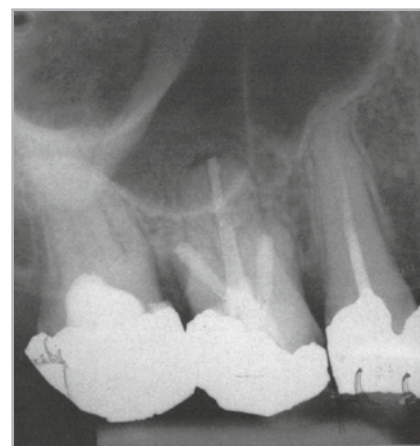
In few cases, I tried Diaket out as root filling material with following fistulation. Treatment is also successful with Diaket, however, I mind that it doesn't pour off the lentulo the perfect way N2 does. It hardens as fast as N2, though. Root filling was followed by a possible apectomy/fistulation after 20 minutes. I also know surgeons who use either N2 or Diaket.

What does the N2 method comprise?

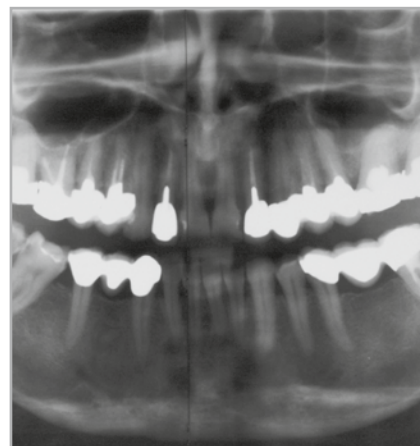
- No canal rinsing
- Use of the reamer as sole root canal instrument
- Rubberdam for safety's sake for manual manipulations only
- Use of the strongly antimicrobial N2 as root canal filling material (the powder contains 4% formaldehyde, EU approval as medical device)
- Root canal treatment in one appointment is the goal (no problem in vital teeth, in non-vital teeth with reservation – in the latter case definitely complete reaming during the same appointment). Alternatively in one appointment finished by "Schröder Airation". According to Sargenti, the "Schröder Airation" comprises a wide treatment spectrum: pain prophylaxis during root canal treatment of non-vital teeth in one appointment plus after overfilling of vital teeth roots, apart from that for pain therapy
- According to Sargenti, point condensation of the root filling is not necessary, however, it looks better on X-ray



1983: Tooth 16 reimplanted with existing parulis



1996: X-ray control after 13 years, NAD



2007: X-ray control after 24 years

What do you think about the frequently discussed ingredient formaldehyde: Systemic distribution in the body according to literature?

There is only an ambivalent answer to this question. The Block study with dogs as test animals circulates in literature. First of all, it has to be made clear that results from animal experiments cannot simply be adopted for humans due to different metabolisms. So formaldehyde features different half-lives in different animal species. In humans, half-life of formaldehyde amounts to 1 – 1.5 minutes. In an N2 court hearing in the US, the former leading US toxicologist Brent stated that the results of the Block study had been misinterpreted. Due to the short half-life, formaldehyde had no longer bonded to marker C14. Correctly, the systemic distribution of C14 in the organs had been detected, however no formaldehyde. At this point, I also wish to criticize laboratory tests (in vitro). An adoption of such results has to be judged skeptically as the enzymes of the living organism are missing.

There is a lot of criticism against N2. What do you think about this and what would you answer the critics?

Counter question should be whether the respective critic refers to literature or whether the argumentation is based on own practical experience. A handful of cases are not sufficient, though. Regarding literature, it has to be clarified whether a so-called "publication bias" does exist, meaning that disagreeable results are not even being published.

What do you think is the reason for the fact that the N2 method is accepted in other countries?

Despite of professorship concerns, N2 has been approved in the EU. Even Sweden has reaccepted the method in 2011 as in some publications, the established endo could not have been presented convincingly – and especially it could not have been proven that newer methods deliver better results. In Oral Surg Oral Med Oral Pathology 2002, 94 (6): 651 – 652, Figdor G. had recorded that endodontics have only achieved a modest progress over the last 100 years. This complies with the statement of NgY et al. in Int. Endot J 2008, 41:6-31 "Outcome

of root canal treatment: systematic reviews of literature – Part 2 Influence of clinical factors". As dental technology had progressed strongly within the last 40 – 50 years, a higher probability of success could have been expected. Endodontists, however, deny this non-increase stating that they are treating more risky endodontic cases now.

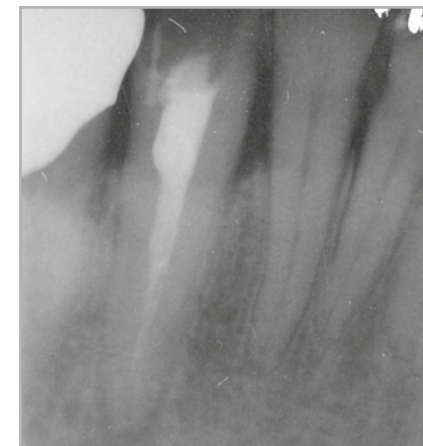
I'd like to add that the AES has in vain struggled to obtain N2 approval by the FDA (US Food and Drug Administration) for many years now. It is not a comfort for the local N2 users that so far also no other root canal filling material obtained an approval. It is shameful that hundreds of X-ray photos required by the FDA could not be relocated by the FDA.

Is there any evidence of cancerogenicity or mutagenicity from your point of view?

Cancerogenicity or mutagenicity could not have been proven by now. However, formaldehyde has been classified as human cancerogene some years ago, i.e. for pharyngeal tumor after consumption of a high dosage. Like in many cases, the same rule must be obeyed: Toxicity depends on the dosage. Still the statement on formaldehyde of the German Federal Medical Association (Dt. Ärzteblatt 1987; 84, issue 45: B 2107 – 82112) comprising that exceeding of a threshold value is the precondition for cancerogenicity keeps validity.

What are your experiences with histological examinations and their healing?

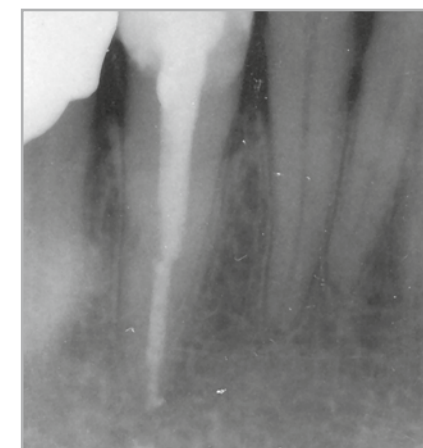
Blind studies should be done, which, to my knowledge, do not yet exist. Test arrangements, the kind of cuts, definition of normality and aberrations are important factors in histology – according to Brynolf only 7% of the histologically examined endo teeth are free from inflammation. And every colleague has surely made the experience of false negative resp. false positive X-ray findings. Apart from that, evaluation of one and the same X-ray picture, done at intervals of some months, often results in a different diagnosis.



Tooth 43 with incomplete root canal filling and apical lesion



Tooth 43 with incomplete root canal filling and apical lesion



X-ray control after 19 months, NAD