Tolerance of dental materials and their influence on patient health

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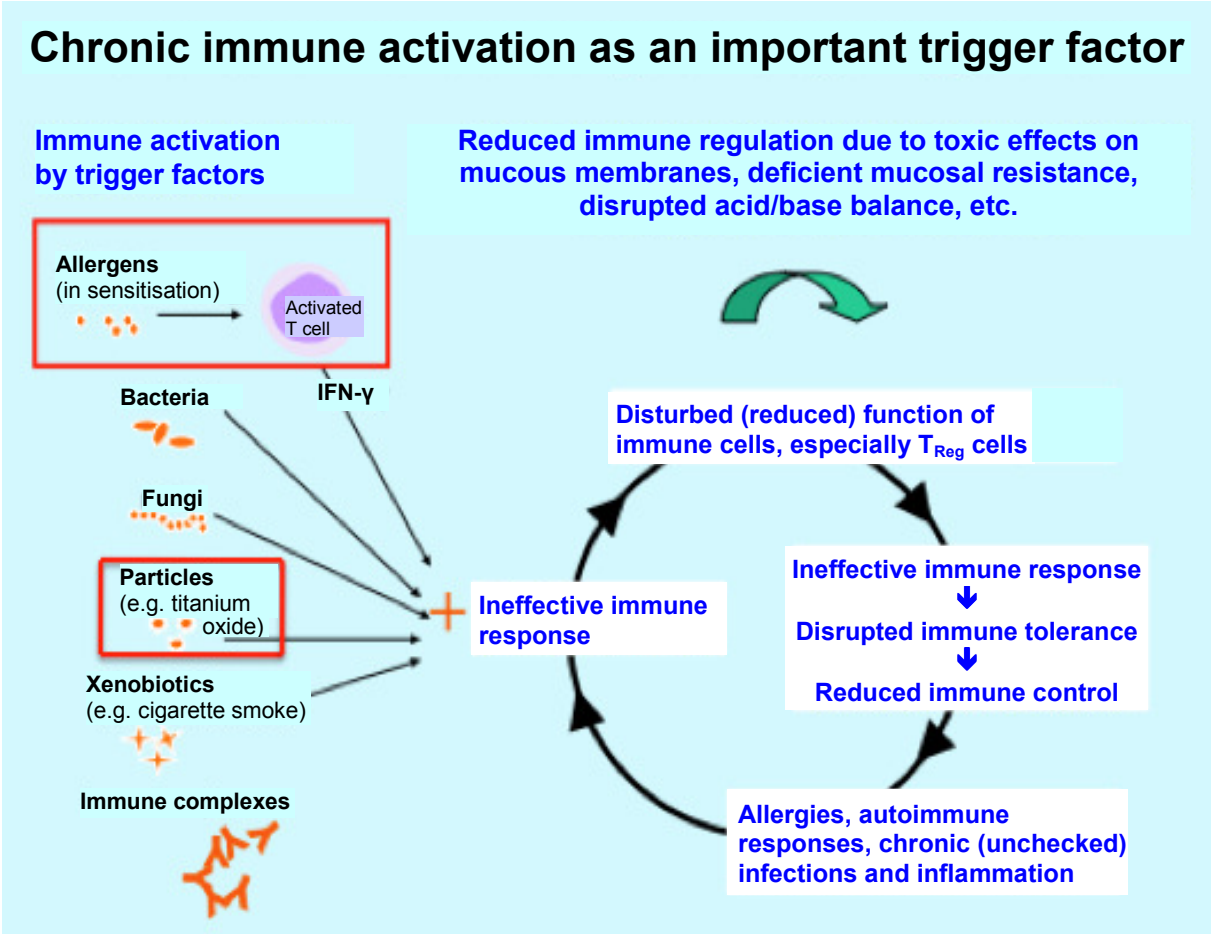
Introduction

Chronic inflammation resulting from permanent immune activation is the basis of many chronic disorders. This dysfunction of the immune system is triggered by various factors, including allergenic, inflammatory or toxic dental materials.

My colleague, Dr. Ingrid Fonk, describes this influence as follows:

I know of no other specialist discipline that affects all other disciplines – without exception - to the extent that dentistry does. All these disciplines are, to a considerable extent, connected with syndromes which are the result of dental materials which patients cannot tolerate.



Case study

This assessment is illustrated impressively by this unusual case where a problem with material was not actually suspected.

A patient who only came for treatment sporadically as she lived some distance away, came to me with acute severe pain in old gold crowns on teeth nos. 36 and 37. I had recommended some time ago that she had these replaced as the crowns were badly worn. Sciatica which had begun two days previously and which rendered her almost incapable of movement nearly prevented this appointment. She only managed the journey with considerable effort.

In situations like this there is not much time for thorough diagnosis but you try to act stringently. Teeth nos. 36 and 37 were both vital and the gingival margin was normal as was the X ray taken 6 months earlier. I decided to remove the crowns. Beneath the crowns extensive, badly corroded remains of amalgam fillings and black mushy caries came to light. After cleaning up the teeth to a solid intact layer of dentine and taking an X-ray, we gave the patient a break on the Bicom therapy couch.

Placing the material which had been removed in the input cup, I conducted an initial elimination, basic therapy 132, 999, 970 and 581.

I can barely describe the patient's reaction. As I tried to help her get up from the couch to continue the dental treatment, she moved her shoulders tentatively, sat up spontaneously, then lay down again, repeating this a few times and not really believing it herself. "I can't quite believe it, I haven't been able to do this for months." Then she jumped off the couch, tried hopping, squatted down, jumped up again. I would have loved to have filmed this dance for, in 10 years of practising Bicom therapy, I have rarely seen such a dramatic result and, in this situation, it exceeded all my expectations.

On questioning the patient, it emerged that the sciatica had not exactly arrived unannounced. The patient who was actually very sporty had, for some time, experienced diffuse symptoms which moved around the back area and which increasingly restricted her movement. After this first Bicom therapy session, this pain actually disappeared completely and did not recur!

At the follow-up appointment 2 weeks later, the teeth were vital and pain-free. The patient no longer had back pain or sciatica. The patient still reacted to gold and amalgam in the AK[1] test. The nutrient point for gold was also positive in the AK test and the patient stated that this area had, in fact, kept giving her trouble in recent months but the "miracle healing" had remedied this. Nevertheless I treated the point according to the test (as recommended by Frau Karz) and then the reaction to gold in the AK test was completely removed.

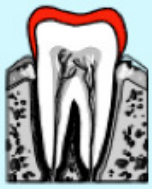
If I were to analyse this case critically, I would say "taken by surprise by Bicom's success".

I should like to take this case as an opportunity to summarise the fundamental problem systematically without getting too involved in materials science or in immunology.

[1] AK = Applied Kinesiology, additional abbreviations in the appendix, page 32

Fundamental problems with dental materials

The immune system can only react to constituents which are released!



→ **Intolerance only occurs to constituents released from materials:**

- **= metal ions**
- **= synthetic monomers and oligomers**

Consequently: most important quality in dental restorative materials

↓

Corrosion resistance of alloys

High degree of polymerisation in synthetic materials

Several thousand materials from a variety of classes of substance are used in dentistry, many of them remaining in the patient's mouth for prolonged periods.

The resulting long-term effect and the particular environment of the oral cavity with varying interaction with other substances and physical influences explain the particular potential risk and the considerable importance as a trigger factor for chronic disease.

The dental industry promotes (almost) all materials as "biocompatible" without explaining what it means by this. In actual fact, material quality and the resulting likelihood of being well tolerated by patients depends upon a number of factors: on the class of substance, i.e. type of material and composition, on product quality which is essentially also dependent upon manufacturing conditions and processing precision. Reactions with other materials also play a role here as does the action of biological factors, e.g. change in pH due to inflammation. Both factors can have an immediate effect or can bring about a change in the material over the course of time (electroplating, corrosion, oxidation, polymerisation inhibition). All dental materials, even zirconium dioxide ceramics, are subject to chemical solubility. Whether such a high quality material is actually biocompatible in individual cases ultimately depends on the recipient (susceptibility) since tolerance of a foreign substance requires as intact a cutaneous and mucosal barrier as possible, a metabolism capable of detoxifying and an immune system capable of regulating the body.

Possible reactions to dental materials

Toxic contamination:

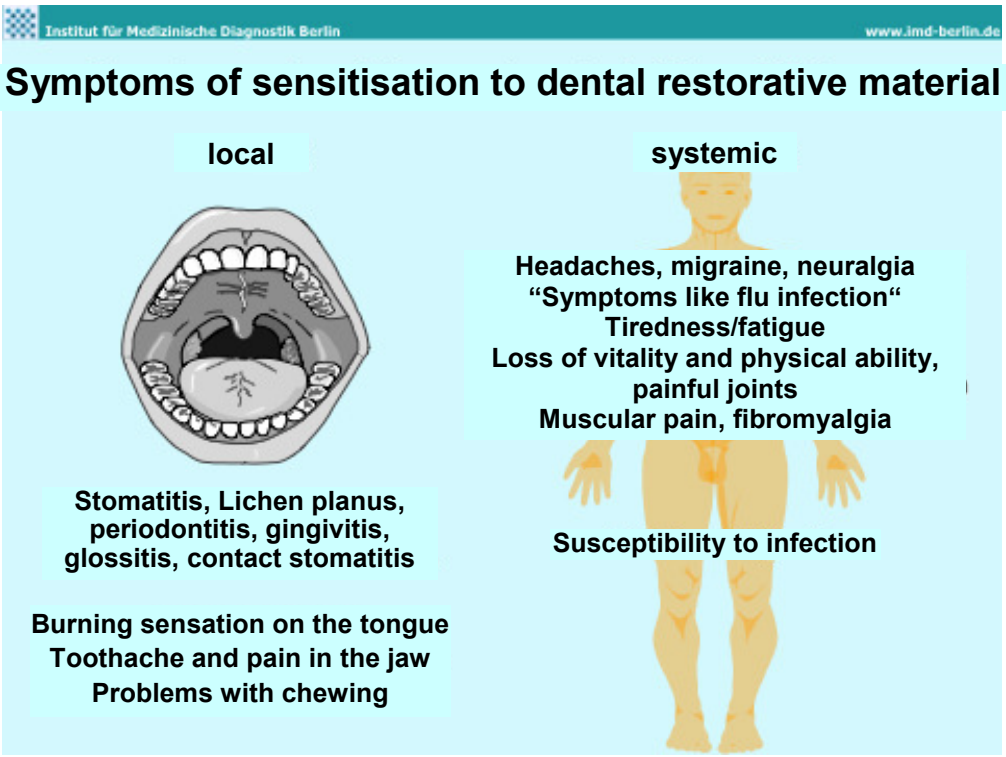
- Occasionally acutely critical concentrations (possible with mercury, arsenic)
- More common chronically accumulating (e.g. amalgam, plastics, fluorides and corrosion products of metals)
- Potentially toxic metals are: mercury, lead, nickel, arsenic, cadmium, palladium, aluminium, tin, chromium, iron, copper, titanium

Cumulative effects lead to an increase in toxicity. With multiple Hg + Pb contamination even low doses < LD1 are toxic!

With immunological intolerance reactions there is no material-related dose-effect relationship as with toxic contamination!

Immunological reactions

1. Sensitisation and allergic reaction Type 1, e.g. plastics, especially acrylates, anaesthetics, root filling materials. Type IV, e.g. metals, plastics, root filling materials
2. Inflammation, specific or non-specific immune cell activation e.g. titanium oxide particles, biogenic amines
3. Autoimmune responses triggered by heavy metals



Symptoms

- Local health disorders in the oral cavity
- Regional disorders in the mucosal area, i.e. gastrointestinal or bronchial tract
- Systemic disorders:
  > immune system
  > neurological, psychiatric disorders
  > endocrine, cardiovascular disorders
  > chronic pain

Collections of toxicological symptoms and homeopathic remedies for metals are also revealing.

Beware: Chronically accumulating contamination and sensitization with Type IV reactions may occur in the absence of local or regional disorders!

In the oral cavity, resistance against pathogens is provided by mucosa associated lymphoid tissue (MALT). High IgA and MBL levels ensure high immunocompetence with good phagocytosis and antigen removal without severe local inflammatory reactions developing. Consequently oral symptoms may prove minimal even in chronic conditions, if the MALT is intact.

Masked or latent intolerance of this kind should be clarified in patients with other known allergies, systemic disorders, symptoms following implants, immunosuppressant medication or occupational diseases. (Record of patient history!)

Tips for diagnosis and problems with tolerance:

- Preventive in at-risk patients or with known critical materials

  Assess anticipated tolerance before inserting a material.

Limitation: testing only ever concerns the current status, the predicted development is always speculative!

- Post-therapeutic to determine cause of illness in sick patients:

-- Clarify a debatable material contamination and its relevance for an existing disease, causal allocation to a pathology and differentiation from other factors – DD: materials, focus and interference field reaction, dysbacteria, structural disorder – CMD, etc., disorder in meridian system associated with teeth, a combination of factors is also possible: material-related inflammation may also possibly lead to the development of biogenic amines

-- identification of materials whose composition is unclear

Diagnostic possibilities

1. Bioenergetic testing

Applied kinesiology, biotensor, EAV, and other methods are particularly suitable for combination with bioresonance since testing with amplification is possible and the input cup represents a good supplement or alternative to oral or epicutaneous exposure which can possibly constitute a risk of sensitisation.

Practical procedure using the example of AK testing

Preventive

Assuming a normoreactive test muscle, the new material being tested is tested orally in its processed state (!) after approx. 60 secs. If the muscle remains normoreactive (check for switch, dysreaction), the material appears to be tolerated individually. The reliability of this evidence is increased by extending the test as follows: subsequent regular daily exposure for approx. 30 mins. for a week and then repeat the AK test.

Testing the material in the input cup with A amplification (192, 196) also represents a good provocation. The often latent dysreaction makes it clear however that it is less problematic for the patient than genuine exposure. This testing with amplification often renders follow-up testing after probative exposure superfluous.

Post therapy to test materials present

Assuming a dysreactive and generally weak test muscle, the potentiated harmful substance is tested. The compensating potency gives an indication of the strength of the contamination. The ampoule can be tested in the hand, in the honeycomb or in the input cup with A program. If no test ampoules are available, an alternative approach is to test a similar material in the input cup with an Ai program.

2. Lab tests

Helpful laboratory analyses are now available for all problems.

Quantitative contamination can be identified by means of:

- *Saliva test* for metal ion content, customary for mercury and other metals
- *Stool and urine* samples, spontaneous or after administering chelates (DMPS, DMSA, etc.)
- *EDTA blood and hair analyses, etc.*

Immunological responses are extremely precise and can be determined without the risk of patient sensitisation associated with blood tests.

- *Basophil degranulation test* (BDT)

  For Type I allergies to plastics and other filling materials (IgE RAST test very imprecise here)

- *Lymphocyte transformation test* (LTT)

  For Type IV allergies to metals, synthetic prosthetics, filling materials and cements

- *Effector cell typing* (allergen induced cytokine secretion)

  Supplements LTT, for clarifying clinical relevance of existing sensitisation. Analysing allergen-induced cytokine secretion reveals the type of sensitisation reaction: IFN-γ (gamma) is dominant in current cytotoxic reactions with allergic manifestation, IL-10 predominates in balanced immune reactions with sensitisation but no clinical symptoms.

- *Titanium stimulation test*

  Non-specific inflammation through monocyte and macrophage reaction to titanium particles with cytokine formation TNFα and IL-1 β (beta).

  Very rarely sensitisation and allergy to titanium due to inhibition through rapid formation of an oxide layer, however inflammatory response through abrasion particles or to rough surfaces.

Determination of genetic polymorphism

Determining capacity for detoxification and tendency to inflammation based on genetic make-up provides information about susceptibility, i.e. the patient's individual sensitivity.

MALT immunocompetence can be identified by determining IgA and MBL. Genetic variations occur here too which can encourage recurrent infections or chronic inflammation.

Method comparison

Even if testing the patient directly probably seems more natural and simpler for most therapists operating holistically, laboratory analysis is still a good supplementary method. It offers an objective and thus irrefutable basis for discussions with insurance companies, health insurance funds, other therapists and the patient too if the removal of large prostheses is involved. The effectiveness of therapy can be recorded by monitoring progress. Through effector cell typing it is possible to assign the particular causal stress to the disorder. Determining genetic polymorphism helps in estimating the patient's predicted resilience and can help optimise drug treatment.

Frau Riedl-Hohenberger demonstrated the similarity and high level of correlation between AK and lab testing in an extensive study involving 85 patients (ICAK International Meeting 2010). With existing contamination correlation was almost 80% (19 types of material tested on 67 patients), when new materials were tested the level of correlation was over 90% (230 comparative tests). The greatest discrepancy occurred when testing titanium which reacted far less often in the energetic test.

Due to its chemical properties, titanium plays a special part in the response pattern both immunologically and energetically.

Assuming correct testing, why can't we expect 100% correlation? In energetic testing we record different parameters from those in lab tests and this results in various thresholds above which a reaction is "measurable".

Assessing the first case study

Which examinations should have been performed here and what results might have been expected?

In the AK test the teeth, thymus, checkpoints for Ly, ODG, NDG and any other EAV test points and pain points on the back should have been tested and checked to see which potentiated metal test ampoules, including sliver amalgam and the tooth nosodes, correct the imbalance. Staufen Pharma's old ampoule "dental gold", which is quite vaguely defined, often tests better here than the individual metals.

Multielement analysis by saliva test and LTT for metals would be appropriate for clarifying material contamination in the lab. The clinical state of the crowns could have been evidence of the release of metal ions into the saliva from the gold alloy. Mercury certainly would not be expected since there were no exposed surfaces.

In view of the considerable corrosion on the adjoining surface and the fact that the problem dated back over 30 years, increased stimulation index for mercury in the LTT would be quite conceivable and would have indicated the amalgam residue beneath the crown.

It emerged that the level of the stimulation index correlated fully with sensitisation with no clinical symptoms or with a manifest allergy.

An increased stimulation index for gold or other alloying partners would also have

been possible. Since, on retesting, there was only still a reaction at NSP gold, the strongest contamination was definitely here. Metal contamination could have been assigned to the chronic inflammatory back pain by effector cell typing.

Pathophysiological response pattern

Toxic contamination

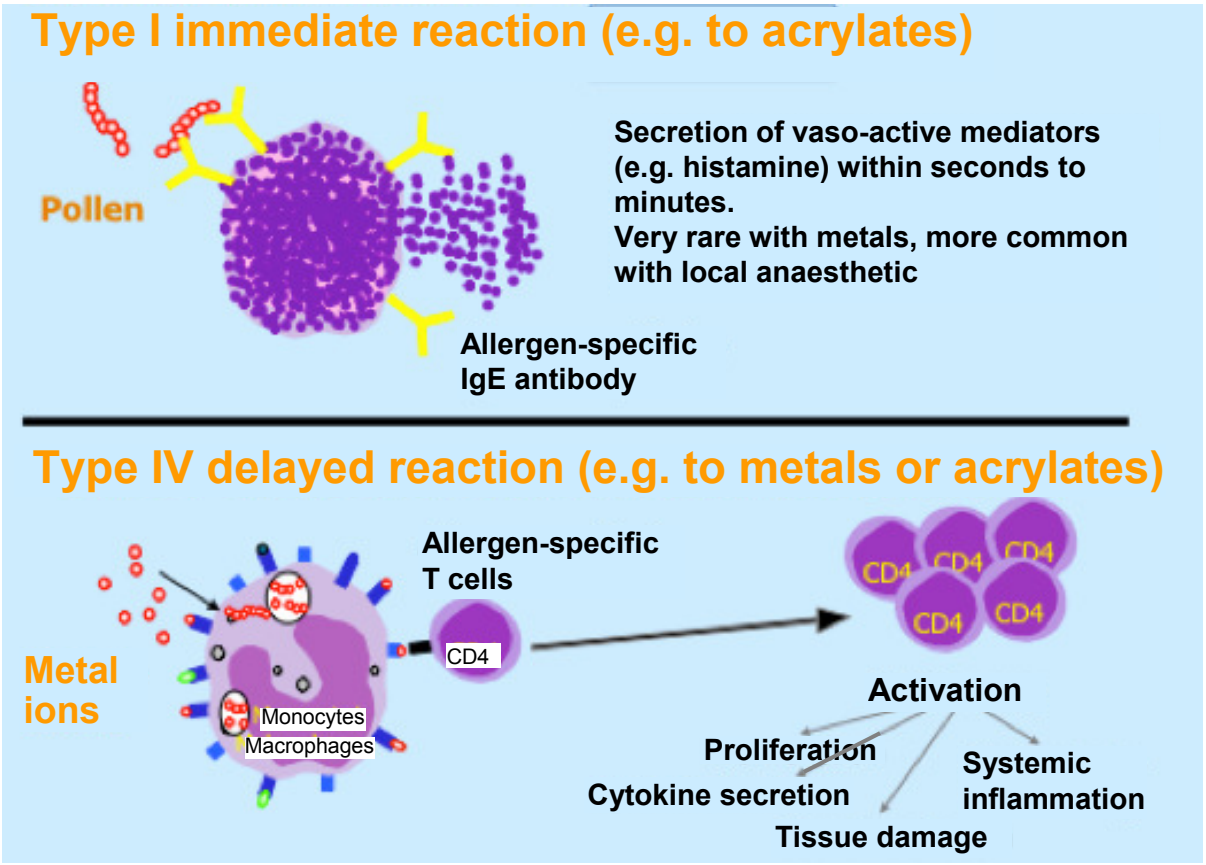
Generally bonding to receptors, thereby inhibiting enzymatic processes, damaging membrane function with the resulting restriction of the redox system and reduction in intracellular energy gain, reaction with nucleic acids encourages mutation and tumours.

Toxic effect of Hg and other metals:

- High bonding affinity to SH, OH, NH_2 and Cl groups
  > Denaturing of protein structures, disruption of membrane functions
- Inhibition of cellular enzyme reactions, e.g. glutathione S transferase
- Reduction in ATP formation by decoupling oxidative phosphorylation
- Effect on cellular and humoral immune system
  > Activation of mast cells, IgE formation, NFκB
- Effect on the vascular system by induction of cell adhesion molecules
- Induction of autoimmune responses
- Oestrogen-like effect of Pb, Hg, Ni, Cr, Co, Cu, Sn
- Carcinogenic effect of Ars, Cd, Ni, Cr, Be, potentially also Pb, Hg, Co, Cu, Fe, Pt
- Impeding essential metals by blocking transport proteins
- Mitochondrial damage by free radicals, oxidative and nitrosative stress
- Neurotoxic effect through stimulation of the glutamate receptors.

Allergy: sensitisation on initial contact with reaction on subsequent contact

Type I: IgE-mediated immediate reaction
Type IV: T-lymphocytic delayed reaction with specific inflammation (cytokines, IFN-γ, etc.)

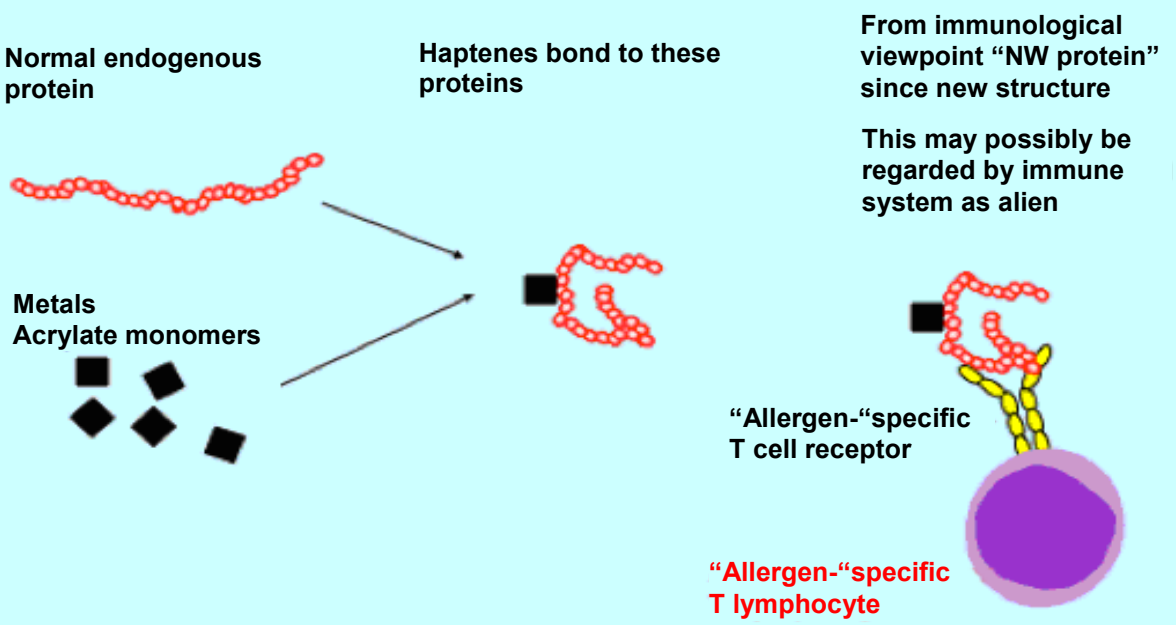


How does metal allergy work?
(See the following two figures on next page)

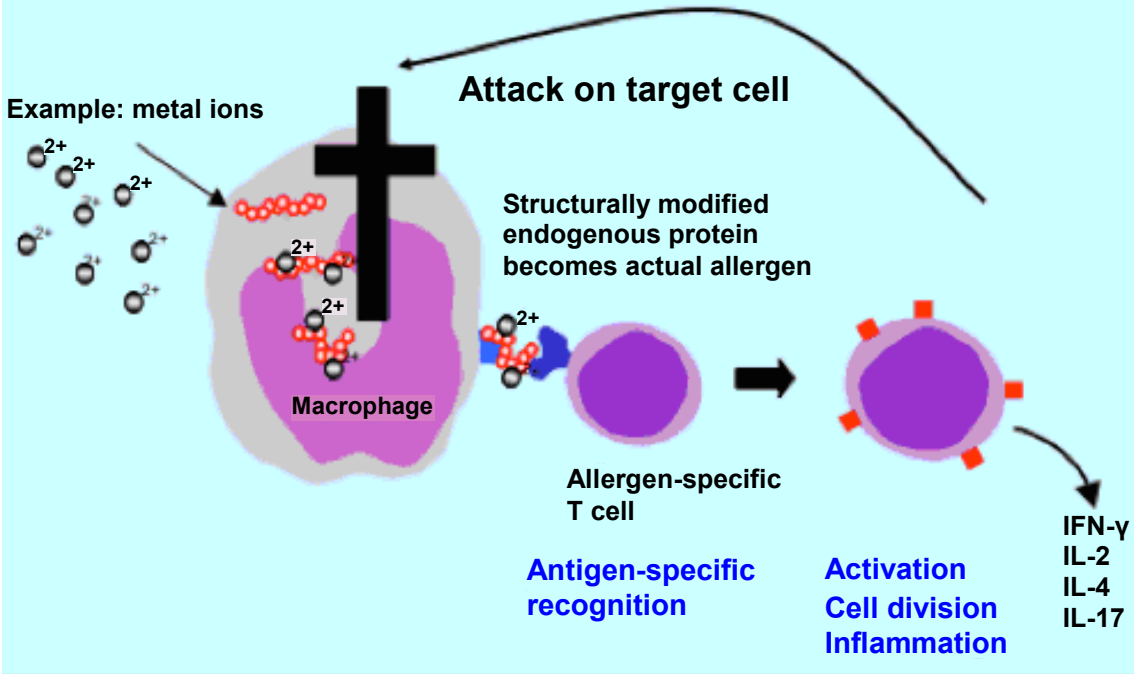
Metal ions are haptenes. They bond with the body's own proteins which are then regarded by T-lymphocytes as alien, with the result that an allergen-specific T-cell receptor is formed. These haptene protein complexes are absorbed by macrophages and presented as antigens. On renewed or sustained contact, antigen-specific T cells are then present which cause T cell proliferation and the development of proinflammatory cytokines, IFN-γ, etc. through clonal proliferation.

An additional receptor of the non-specific immune system (TLR4) has now been identified for nickel allergy.

Metals and acrylates are haptenes



How does metal allergy work?



Options for therapy

Compensatory measures are all less effective with antigen-specific reactions than with non-specific inflammation or quantitative contamination. Genetic factors in detoxification capacity and inflammatory tendency cannot be influenced either!

Preventive:

Abstinence, compensating materials, improving tolerance through general relief and monitoring inflammation: fortify eliminating organs, reduce trigger factors by eliminating costimulants (other materials, pathogens).

Bicom: Adaptation treatment, therapy via nutrient points

Manifest contamination:

You should always endeavour to remove materials which are not tolerated but this is not always possible immediately. Compensation measures should not mislead therapists into adopting a carefree attitude towards materials but experience shows that we able to reduce numerous stresses through elimination and can also increase tolerance of materials.

BICOM programs:

Frequency according to symptoms and testing:

Basic therapy (!)	
Meridian programs	
Toxin elimination	970
Allergy	970, 979, 999, 998
Increasing powers of resistance:	570
Activation	125, 900, 428
Compensation	127, 128
ATP synthesis	846
Autoregulation	432, 827, 281
Irritation of the bladder:	490
Blocks	581, 915, 918, 927
Intestine/lymph	930, 830
Energy/calcium	580
Tissue processes	922, 923
Pituitary gland	916
Immune system	953, 582
Implant, pre,	991, 424, 970, 290,
Implant, post:	331, 524, 422, 650
Liver	430, 431
Stomach	331, 461, 861, 910, 911
Kidneys	480, 481
Acid/base	812
Oxygen	802
Thymus	428

Nutrient point, new programs from Sissi Karz

Gold	980 Hz, Ai 14
Silver	190 Hz, Ai 29
Titanium	8.9 Hz/18 Hz, Ai 4
Yttrium	364 Hz, Ai 9
Nitrogen	89 Hz, H+Di
Radon	39 kHz, Di
Caesium	89 kHz, Ai 1,75

Medication:

Supplementary (homeopathic remedies, phytotherapeutic remedies, orthomolecular substances, chelates) to stabilise physiological processes or bind and eliminate toxins.

Diagnosis and therapy by means of nutrient points

How can nutrient points (NSP) help?

In preventive testing a reaction at the NSP is only expected if contamination already exists. The points are rather slow as an indication of a short-term disorder or intolerance.

But the points should be involved when testing existing contamination. If they react this indicates high-level contamination. Interactions with other metals and minerals can also be clearly identified.

And they are a good means of monitoring progress with effective therapy (relief, stimulation, substitution), since a rapid marked change in the test reaction to appropriate measures is often seen.

A therapy program is defined for a number of NSP. This can be used preventively with other adaptation programs to improve tolerance. This is sometimes useful with at risk patients, also before fitting orthodontic devices as almost all the wires, brackets and collars used are not completely free of nickel.

The real benefit however lies in treating existing contamination. It is not always possible (and really necessary) to remove materials immediately. Alongside other measures which improve regulation, it is often possible to increase tolerance of the material. Or, once the material is removed, treatment of the NSP supports the other eliminating measures.

Summary

It is true of most materials used in dentistry that:

"intolerance" is an individual variable, dependent upon external and a number of individual genetic and epigenetic factors. Each case always needs to be assessed on its merits and the effort of testing is justified – from the point of view of energy expended and/or lab analysis involved – if one of the risk criteria applies to the patient or the material. Understanding the pathophysiological and immunological mechanisms underlying a reaction due to intolerance shows us the therapeutic options and limitations of dealing with the problem.

Bioresonance therapy is an important tool for maintaining or restoring our patients' regulatory systems so that they are able to tolerate foreign substances and also dental materials sufficiently.

Appendix

Laboratory analysis

Institut für Medizinische Diagnostik [Institute of Medical Diagnosis], Nicolaistr. 22, 12247 Berlin (LTT etc.). I should like to thank Dr. v. Baehr for supplying the illustrations of immunology and laboratory analysis.

Medizinisches Labor Bremen [Bremen Medical Laboratory], Haferwende 12, 28357 Bremen (saliva test and other environmental analyses)

Further information

DGUZ – Deutsche Gesellschaft für Umwelt-ZahnMedizin [German Society for Environmental Dentistry]

GZM – Internationale Gesellschaft für Ganzheitliche ZahnMedizin [International Society for Holistic Dentistry]

Dr. Ingrid Fonk, Ganzheitliche Zahnheilkunde [Holistic dentistry], Spitta-Verlag 1996

H.-W. Feldhaus, Homöopathie und ganzheitliche Zahnmedizin [Homeopathy and holistic dentistry], Sonntag Verlag

Illustrations in the appendix

All the nutrient points in Karz' system are portrayed; only the points relevant for dental materials are marked by lines with their therapy programs.

Abbreviations (alphabetical)

AK	=	Applied Kinesiology
Ars	=	arsenic (chem. symbol = As)
ATP	=	adenosine triphosphate
BDT	=	basophil degranulation test
Be	=	beryllium (chem. symbol)
Cd	=	cadmium (chem. symbol)
Cl	=	chlorine (chem. symbol)
CMD	=	craniomandibular dysfunction
Co	=	cobalt (chem. symbol)
Cu	=	copper (chem. symbol)
Cr	=	chromium (chem. symbol)
DD	=	differential diagnosis
DMPS	=	dimercaptopropane sulfonate
DMSA	=	dimercaptosuccinic acid
EAV	=	Voll's electroacupuncture
EDTA	=	European Dialysis and Transplant Association
Fe	=	iron (chem. symbol)
ICAK	=	International College of Applied Kinesiology
IFN	=	interferon
IgA	=	class A immunoglobulin
IgE	=	class E immunoglobulin
IL	=	interleukin
H	=	hydrogen (chem. symbol)
Hg	=	mercury (chem. symbol)
LD	=	lethal dose
LTT	=	lymphocyte transformation test
Ly	=	EAV point for lymph vessel
MALT	=	mucosa associated lymphoid tissue
MBL	=	mannose binding lectin: protein promoting mucosal resistance
N	=	nitrogen (chem. symbol)
Ni	=	nickel (chem. symbol)
NDG	=	EAV point for nerval degeneration
NFκB	=	cytokine necrosis factor κB (kappa B)
NH_2	=	amine group
NSP	=	nutrient point according to Karz' system
O	=	oxygen (chem. symbol)
ODG	=	EAV point for organ degeneration
OH	=	hydroxyl group
Pb	=	lead (chem. symbol)
Pt	=	platinum (chem. symbol)
RAST	=	radioallergosorbent test
S	=	sulphur (chem. symbol)
SH	=	sulfhydryl group
Sn	=	tin (chem. symbol)
TLR4	=	toll-like receptor 4
TNFα	=	tumor necrosis factor **α** (alpha)

Karz' system of nutrient points – Dental materials