Contact allergic gastritis: an underdiagnosed entity?

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SUMMARY

Only a few cases of contact allergic gastritis in patients with nickel allergy have been reported. We report a case of probable contact-allergic gastritis in a 46-year-old woman. Clinical examination revealed lichenoid mucosal lesions of the gums adjacent to bridges and crowns that had been implanted several weeks back. Since implantation, the patient had suffered from gastrointestinal complaints (including stomach pain). Gastroscopy showed eosinophilic gastritis. Patch testing done under the diagnosis of contact allergic stomatitis showed positive reactions to: gold sodium thiosulphate; manganese (II) chloride; nickel (II) sulphate; palladium chloride; vanadium (III) chloride and zirconium (IV) chloride. The crowns and bridge contained gold, palladium and zirconium chloride, hence they were replaced by titan-based dentition. Shortly after replacing the artificial dentition, all gastrointestinal symptoms resolved spontaneously without further treatment. Delayed-type allergy against the components of artificial dentition seemed to be the cause of gastritis.

BACKGROUND

Little is known about the incidence of contact allergic gastritis in humans. Only a few experimental animal studies investigating this entity have been conducted. In the 1960s, the research teams of Bicks, Rosenberg and Macher^{1–3} were able to elicit delayed hypersensitivity reactions in the stomach and in the colon of guinea pigs by intra- and epicutaneous sensitisation followed by oral challenge. Nakajima^{4 5} was able to induce allergic gastritis in guinea pigs using potassium bichromate, dinitrochlorobenzene, dinitrofluorobenzene and picryl chloride. In 1996, allergic gastritis was reported in a young girl who had accidentally swallowed a nickel-containing Canadian currency.⁶ Nickel-allergic-contact dermatitis had been observed in this young patient after contact with nickel-containing ear-rings and spectacles. The coin was removed 5 days after swallowing and, although she did not report gastrointestinal symptoms or pain, biopsies taken during gastroduodenoscopy to remove the coin showed gastritis and duodenitis with an increase in the number of eosinophils, lymphocytes and plasma cells in the mucosa in combination with a highly reactive epithelium.⁶ The girl also suffered from an itchy, papular skin rash that developed several hours after swallowing the coin and resolved rapidly after its removal.

CASE PRESENTATION

A 46-year-old woman reported a 10-week history of itchy mucosal lesions of the gingiva adjacent to ceramic-blended crowns composed of a gold-containing alloy in her right and left upper jaw. A zirconium-oxide-containing bridge had been implanted 12 weeks back in her left lower jaw

(figure 1). Since implantation of this artificial dentition, she had further suffered nose swelling as well as gastrointestinal complaints (colic-like pains; pressure and pain in her stomach and diarrhoea). She also reported that she had suffered from stomatitis-like symptoms several years ago that resolved spontaneously after removal of amalgam-containing dental fillings that had been replaced by ceramic inlays.

INVESTIGATIONS

Laboratory investigation (complete blood count, determination of levels of C reactive protein, anti-nuclear antibodies and antibodies against BP 180 and desmoglein 1 and 3 to rule out bullous autoimmune diseases) were not abnormal. Gastroscopy and histological investigation of mucosal biopsies taken during this procedure showed a non-erosive eosinophilic gastritis without proof of *Helicobacter pylori* (figure 2). Patch testing with Deutsche Kontaktallergie-Gruppe standard series (Allmirall Hermal, Reinbek, Germany) and relevant dental metals as well as substances relevant for dental technicians (Almirall Hermal) were undertaken. Allergens were applied on the upper back with Finn Chambers on Scanpor (Epitest, Tuusula, Finland) and Fixomull Stretch tape (BSN Medical, Hamburg, Germany) and removed after 1 day to avoid irritation. Readings were taken on days 2, 3 and 4 according to guidelines set by the International Contact Dermatitis Research Group. Delayed readings were carried out after 1 and 2 weeks.

RESULTS

Positive reactions were observed after 48 and 72 h in gold sodium thiosulfate, manganese (II) chloride, nickel (II) sulphate, palladium chloride, vanadium (III) chloride, zirconium (IV) chloride, fragrance mix, fragrance mix II, hydroxyisohexyl-3-cyclohexene carboxaldehyde and sandalwood oil. Standard prick testing using common aeroallergens and food allergens (Bencard, Munich, Germany) was negative. The patient did not have a history of atopic disease.

TREATMENT

Gold sodium thiosulphate, palladium chloride and zirconium (IV) chloride seemed to be of medical relevance because the crowns and bridge contained these allergens. Thus, the crowns and bridge were removed and replaced by titan-based crowns and bridges that had been blended with ceramics. Shortly after replacing the artificial dentition, all gastrointestinal symptoms resolved spontaneously without further treatment.

OUTCOME AND FOLLOW-UP

The patient has remained free from stomatitis and gastritis for >40 weeks.

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Figure 1 Lichenoid inflammation of the gingiva directly adjacent to ceramic-blended gold crowns in the right (A) and left (B) upper jaw. Severe inflammation of the gingiva became obvious after removal of the zirconium-containing bridge (C).

DISCUSSION

Our patient developed itchy lesions in the gums a few days after implantation of crowns in her right and left upper jaw that were composed of a gold-based alloy, with the addition of palladium, platinum, copper, zinc and tin and a zirconium-containing bridge in the left lower jaw. Simultaneously, she developed gastrointestinal symptoms such as stomach pain and colic-like symptoms. Patch testing showed several cutaneous sensitisations from which at least those against gold sodium thiosulphate, palladium chloride and zirconium (IV) chloride seemed to be of medical relevance because the crowns and bridge contained these allergens. Thus, the crowns and the bridge were removed and replaced by

titan-based crowns and bridges that had been blended with ceramics. Shortly after replacing the artificial dentition, all gastrointestinal symptoms resolved spontaneously without further treatment. On the basis of this clear time-dependent correlation between symptom onset shortly after implantation and their spontaneous resolution after removal, it is rational to suggest that stomatitis and gastritis were caused by a delayed-type hypersensitivity reaction. One can hypothesise that at least part of the delayed-type sensitisation had been acquired by the amalgam-containing dental fillings. Unfortunately, accurate composition of these fillings could not be found out retrospectively. However, the presence of eosinophils and plasma cells in stomach biopsy does not point to an allergic pathogenesis. Eosinophilic digestive disease (EDD) includes a broad spectrum of gastrointestinal diseases from the oesophagus to the rectum.^{7–11} Recently, authors have hypothesised that EDD and allergic rhinitis or allergic asthma display distinct presentations of the same disease because most EED patients are atopic.^{7–11} Eosinophilic infiltration of stomach mucosa can also be observed in patients with bacterial and parasitic infections (including *H pylori*), inflammatory bowel disease, myeloproliferative disorders, allergic vasculitis and drug hypersensitivity.⁹ Our patient was neither atopic (she had an inconspicuous skin-prick test and a negative medical history of asthma or allergic rhinitis) nor did she suffer from any other disease that can elicit eosinophilic gastritis or stomatitis. *H pylori*-infection could be excluded by immunohistopathological investigation of stomach biopsies. Stool investigation was negative for yeast and parasites.

In summary, it is likely that an allergic pathogenesis of gastrointestinal symptoms and the underlying gastritis observed in our patient is probable. It is likely that the causative allergens were released from the crowns and bridge by saliva components in combination with acid-containing food products. This pathogenic mechanism has been shown in patients with contact stomatitis that had been induced by metal bridges, crowns and dental braces.¹² If confronted with obscure gastritis-like symptoms, clinicians should consider late-type allergy against components of artificial dentition as a rare cause for these disorders.

Learning points

- ▶ Contact allergic stomatitis is a rare disease resulting from delayed-type sensitisation against components from dental fillings, crowns, bridges and braces.
- ▶ Contact allergic gastritis is also seldom reported. Most cases have resulted from swallowed objects such as coins.
- ▶ Contact allergic gastritis resulting from swallowed metal salts released from artificial dentition by saliva components or food acids has not been reported.
- ▶ We believe that the development of contact allergic gastritis is possible in every patient suffering from contact allergic stomatitis if he/she swallows the causative agent.

Figure 2 Gastritis with CD138-positive plasma cells (A), a lymphocytic infiltrate (staining with anti-CD43 antibody; B) and multiple eosinophils (Giemsa staining; C).

Competing interests None.

Patient consent Obtained.

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