

IN BRIEF

- This case highlights the eating disorder pica.
- Pica may affect the oral tissues and should be considered as a rare cause of tooth wear.
- Treatment of the case emphasises the need for careful planning and close liaison with the laboratory.
- The case was managed by combined fixed and removable prostheses.

Tooth wear as a result of pica

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This paper reports a case of tooth surface loss as a result of the eating disorder pica. Background to the condition is discussed and the clinical findings and treatment of the patient outlined. The case illustrates a rare cause of wear which should be considered when patients present with an unusual pattern of tooth surface loss.

INTRODUCTION

Pica is an eating disorder typically defined as the persistent eating or mouthing of non-nutritive substances. Individuals with pica have been reported to mouth and/or ingest a wide variety of non-food substances including clay, soil, sand, stones, grass, hair, faeces, lead, laundry starch, vinyl gloves, plastic, pencil erasers, ice, fingernails, paper, paint chips, coal, chalk, wood, plaster, light bulbs, needles, string, burnt matches and cigarette butts.^{1,2}

The term pica comes from the Latin for magpie, an allusion to the bird's omnivorous feeding habits.³ It is most frequently seen in small children, pregnant women and individuals with learning disabilities. It is the most common eating disorder observed in the latter group occurring in approximately 10-15% of individuals^{2,4,5} and, apart from during pregnancy, is rarely seen in adults who are not learning-disabled.⁴ It has been observed in 20% of pregnant women.⁶ The prevalence of the

condition in the general population is unknown as it is often unrecognised and under-reported and there is also often reluctance by patients to admit to the practice. However research suggests that it occurs in 25-33% of young children and there is a decrease in the condition with age. It is only considered pathological in children aged over 18 months. Pica has been reported from around the world and is a widespread, culturally sanctioned practice in some tribe-based societies. In some African countries soil is sold for the purpose of ingestion.¹

Pica can result in serious medical sequelae depending on the nature and amount of the substance ingested. The most common toxicity is lead poisoning from substances contained within the soil or other sources such as lead-based paints.⁷ Other toxicities reported include hyperkalaemia from the consumption of burnt match heads,¹ clay-induced hypokalaemia⁸ and mercury poisoning from paper pica.⁹ Furthermore, soil or clay ingestion has been associated with parasitic infections such as toxoplasmosis and toxocariasis.¹ Pica can also result in various gastrointestinal tract problems including obstructions, perforations, ulceration and constipation.^{1,3,10}

In addition to various psychosocial and cultural hypotheses over the cause of

pica, numerous links to nutritional deficiencies have been made. Although there is no firm evidence of an association, deficiencies in calcium, zinc, nicotinic acid and vitamins B₁, C and D have been linked with pica. However, iron-deficiency anaemia has most commonly been reported to have a possible link to the condition. Pica has been recognised for centuries and has been thought to be a symptom of anaemia since the time of Hippocrates,^{3,11} but this proposed relationship has never been fully understood. Indeed, it has been proposed that pica may be either a cause or an effect of iron-deficiency anaemia.¹²⁻¹⁷ For example, in some patients with malnutrition who eat clay, iron deficiencies have been diagnosed. It is not known whether the deficiency prompted the ingestion of the clay or whether eating the clay resulted in the inhibition of iron-absorption as clay is thought to impair iron absorption by binding iron in the gut.^{3,18,19} Anaemia is a common complication of pregnancy²⁰ and the relatively frequent observation of pica in pregnant women further suggests a biochemical role in the aetiology of the condition.²

This case report concerns a patient who presented with generalised tooth surface loss and damaged restorations as a result of pica.

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CASE REPORT

A 56-year-old female was referred to the Department of Restorative Dentistry, Newcastle Dental Hospital, by her general dental practitioner for an opinion with regard to her tooth wear. The referral letter stated that the patient was unaware of any para-functional habits that may be contributing to the wear but gave no mention to any other possible aetiological factors. However, on detailed questioning the patient admitted to a habit of mouthing and grinding stones and grit between her teeth, a fact that she had not discussed with her dentist or any other health professional previously.

The patient reported that she picked up small pieces of grit and stones from the ground and held them between her teeth for varying amounts of time. This habit started when she was pregnant with her first child in 1976 but ceased post-partum. The patient did not adopt the habit during her second pregnancy but it restarted when she was pregnant for the third time some seven years later. However, on this occasion it persisted for 10-14 years. She then stopped the practice for several years before starting it again five years prior to referral. On each occasion that she ceased the habit, she stated that it was a deliberate decision she made herself and stopping had been easy. However, the patient could give no explanation about why she started in the first place or continued again at the various intervals.

The patient had been diagnosed with iron deficiency anaemia around the time of her most recently re-establishing the habit. There was also a significant amount of stress in her personal life around this time. The patient made no connection between these facts and mouthing the grit. With regard to her medical history at the

time of her referral, she was still taking iron supplements and was on hormone replacement therapy. Otherwise, no relevant medical history was elicited and she is a non-smoker. The patient is a project worker dealing with children with behavioural difficulties.

Examination revealed a slightly atrophic and depapillated tongue. The oral hygiene level was seen to be reasonable and the periodontal health was good with no evidence of bleeding or significant pocketing. The following 20 teeth were seen to be present: 16, 14, 13, 12, 11, 21, 22, 23, 28, 36, 35, 34, 33, 32, 31, 41, 42, 43, 44, and 47. The upper six anterior teeth and 36 were restored with porcelain fused to metal crowns and 21 was root filled with a post present. Amalgam restorations were present in 14, 35 and 47.

There was widespread tooth surface loss that was diagnosed as being abrasive in origin secondary to the eating disorder pica. Fracture and roughening of the porcelain crowns was present and the remaining teeth showed grade 4 wear according to the Smith and Knight Toothwear Index.²¹ In particular, the lower anterior teeth opposing the porcelain crowns were extremely worn. The retruded contact position (RCP) was between 28 and 36, which produced significant space anteriorly. Figure 1 shows the condition of the teeth on presentation.

Radiographic examination revealed only minimal bone loss associated with the teeth and no caries or periapical pathology was detected. All of the lower anterior teeth were responsive to pulp testing in the normal range.

Blood was taken in order to look for any possible deficiencies. The following haema-

tological and biochemical investigations were carried out: full blood count; urea and electrolytes; serum ferritin, vitamin B₁₂, red cell folate, zinc and inorganic lead. The results for all of these tests were normal except for serum ferritin that was slightly low at 15mcg/l (normal range for post-menopausal women: 20-200mcg/l).

Following consideration of a diagnostic wax-up and full discussion of the various treatment options with the patient, she was managed with a combination of fixed and removable prosthodontics. In the upper arch, porcelain fused to metal (PFM) crowns were placed on 14, 13, 12, 11, 21 and 22. Tooth 23 was used as an abutment tooth for a cantilever bridge to replace 24 and gold onlays were placed on 16 and 28.

The upper cast had been examined with a surveyor prior to placing the restorations with regard to designing a partial denture. The restorations on 16, 14, 23, 24 (pontic) and 28 were milled to incorporate appropriate rests, undercuts and guide planes and a cobalt-chrome upper partial denture was provided.

In the lower arch, a PFM crown was placed on 44 and indirect composite onlays were placed on 43, 32, 41, 31, 32, 33 and 34. Photographs of the completed case are shown in Figure 2.

DISCUSSION

As previously stated, pica in adults is uncommon apart from individuals with learning disabilities. The patient reported is well educated with no history of mental illness or learning disability of any kind. However there are similarities with other reported cases: the patient was embarrassed about her habit and had not disclosed the information to either family or other health professionals prior to her attendance at the dental hospital; the pica had originally started while she was pregnant; and there was a history of anaemia.

Tooth surface loss as a result of pica has been documented previously. Wear due to chewing and swallowing sand has been reported and although the paper did not refer to pica by name, this was undoubtedly the condition of the patient involved.²² Another paper reported a pregnant female who routinely consumed clay during her seven pregnancies and had widespread abrasive toothwear.²³ Other adverse effects on the oral tissues due to the ingestion of different substances have also been reported² and the oral manifestations of lead poisoning and iron deficiency anaemia can be widely found in many oral pathology textbooks. The effect of mouthing stones on the dentition in this case was obvious. The only other possible oral manifestation of the condition was a slightly atrophic tongue,



Fig. 1 Pre-op photographs showing the widespread tooth surface loss and fractured restorations discussed in the text. Anterior views with teeth together (a) and apart (b), and upper

a sign of iron deficiency anaemia. This had been recently diagnosed by her GP and the blood tests taken revealed a slightly low serum ferritin level.

The prognosis of the case appears to be good. The patient is adamant that she can control the pica and she is maintaining a good level of oral hygiene. Laboratory made temporary crowns were placed for a period of three months prior to placing the definitive restorations and there was no evidence of damage to these during this time. Likewise, there has been no evidence of damage to the definitive restorations and they are still sound. She remains under regular review. With the

patient's consent, her GP and GDP were notified of the pica. No further medical intervention with regard to the habit has been necessary.

This case highlights the importance of fully exploring the aetiology of tooth surface loss when recording a history and identifies a rare cause of abrasion which should be borne in mind when a patient presents with an unusual pattern of wear.

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Fig. 2 Completed case showing anterior views with teeth together (a) and apart (b), and upper occlusal views with the denture in place (c) and removed (d) showing the milled restorations 16, 14, 23, 24 and 28