



Medical audit

The role of regurgitation and other symptoms of reflux disease in palatal dental erosion; an audit project

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The presence of palatal erosion has been associated with acid originating from the stomach of patients with eating disorders.^{1,2} In 1996, Bartlett *et al.* reported the results of a study investigating the role of gastro-oesophageal reflux (GOR) in palatal dental erosion.³ In that study of 36 patients presenting with significant palatal dental erosion, 23 (64%) had pathological levels of GOR using internationally recognised criteria. Of these 23 patients, 7 (30%) had no symptoms of GOR. The conclusion was that regurgitation of gastric juice caused by GOR is an important cause of palatal erosion and that not all patients are aware of GOR. These patients are known by gastroenterologists as 'silent refluxers'. These findings supported research from the US, which found similar levels of GOR in patients with dental erosion.⁴

Gastro-oesophageal reflux is a common complaint with most people suffering symptoms at some point in their lives. The sale of over-the-counter medication to control the symptoms of reflux serves to support this observation.⁵ When gastric juice passes through the lower oesophageal sphincter (LOS), and remains for a

time within the lower part of the oesophagus, it can cause symptoms in some patients. These symptoms are commonly heart-burn, epigastric pain or dysphagia.⁶ In some patients, the acidic contents of the stomach pass further up the oesophagus to reach the mouth and this is described as regurgitation. Before the gastric juice enters the mouth, it must pass through the upper oesophageal sphincter formed around the cricopharyngeal muscle in the larynx. This sphincter is the final barrier to regurgitation.

Gastroenterologists define the levels of acid within the oesophagus by measuring pH over 24 h using minute electrodes contained within catheters passing from the nose down to a position 5 cm above the lower oesophageal sphincter. This technique of ambulatory pH measurement is the internationally accepted standard for the assessment of pathological GOR.^{7,8} The information supplied by these investigations is used to prescribe medication used to control GOR.

In the management of erosion, it is important to determine the cause if possible so that the right preventive measures can be taken.⁹

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The audit

Since the report by Bartlett *et al.*³ in 1996, which was based on patients referred to Guy’s Dental Hospital and subsequently investigated at the Dental Hospital and the Department of Surgery at Guy’s Hospital, the proportion of patients with palatal dental erosion who are referred for 24 h pH tests has increased. More patients with palatal dental erosion but no symptoms of GOR (potential silent refluxers) have also been referred. Investigation of reflux is costly and invasive; hence, this audit of the outcome of these referrals had the following questions in mind: (i) should patients with palatal dental erosion be investigated for GOR?; (ii) will they attend these appointments and does the presence or absence of symptoms affect the attendance pattern?; (iii) will GOR be found in patients with and without symptoms – can the Bartlett *et al.*³ study be repeated?; (iv) will doctors prescribe medication based on these results?; and (v) will the patients take the medication and does compliance with prescribed medication relate to the presence or absence of symptoms?

What did the audit show?

Table 1 presents the results of the audit. Of 106 patients referred for investigations, 28 (26%) were not tested because they declined the test (22) or failed to attend (6). This indicated that the criteria for referral should be reviewed.

Of the 22 who declined the test, 17 had no symptoms. It is perhaps not surprising that those without symptoms were the group most likely to decline.

Table 1 The numbers of patients (% of the total referred for investigation) with dental erosion who were investigated and not investigated for GOR. The remaining 6 patients who were referred for investigation failed to attend for their appointment

	Symptoms	No symptoms	Total
Patients investigated	48 (48)	30 (30)	78 (78)
Not investigated	5 (5)	17 (17)	22 (22)
Total	53 (53)	47 (47)	100 (100)

Table 2 The number of patients with symptoms (% of total investigated) compared to the presence of GOR confirmed by 24 h ambulatory pH measurement

	Positive GOR result	Negative GOR result	Total
Symptoms	30 (38)	18 (23)	48 (61)
No symptoms	14 (18)	16 (21)	30 (39)
Total	44 (56)	34 (44)	78 (100)

Table 3 The number of patients (%) prescribed medication to control regurgitation with the presence of symptoms. Three patients did not attend for a review appointment and one person died some time after the investigation

	Medication	No medication	Total
Symptoms	11 (28)	16 (40)	27 (68)
No symptoms	5 (12)	8 (20)	13 (32)
Total	16 (40)	24 (60)	40 (100)

Table 2 shows that of the 78 patients tested, 44 (56%) had GOR and 34 (44%) did not, using the criteria used by gastroenterologists. Of those showing GOR, 14 (32%) were symptomless and this confirms the earlier work by Bartlett *et al.*³ Of the 34 patients without GOR on the day of the test, 18 had symptoms of GOR and it is possible that GOR might have been found had the test been repeated. The condition is known to be episodic. Seven subjects, five with symptoms of GOR, had more than one test. All of these had a negative test result on the first investigation and were found to have pathological levels of GOR on the repeated test. It is possible that repeating the test for some of the patients with an initial negative result would have produced pathological levels of reflux on subsequent attempts. Although the test is taken over 24 h and patients are advised to carry out a near normal routine, some do not and consequently the results may not represent a true reflection of the problem.¹⁰ The test has been thoroughly investigated by gastroenterologists and its specificity and sensitivity is known to be good.¹¹ Despite this, it may not be the most appropriate test for patients with erosion as most have a motility problem with the oesophagus as the refluxate is not returned to the stomach and consequently regurgitation into the mouth occurs.¹² However, in most patients with reflux disease the gastric reflux remains around the lower oesophageal sphincter and the test is probably more accurate.¹³ The pH observed in healthy stomachs ranges from pH 1–2, in the oesophagus around pH 6–7,^{14,15} and in the mouth around pH 7.³ However, during eating, the pH in the stomach alters as it does around the distal oesophagus and depends on the pH of the food consumed.¹⁴

All 44 patients with symptoms of GOR were offered medication either by the gastroenterologists or by their general practitioner, but it was accepted by only 11 patients with symptoms and 5 without (Table 3).

Treatment to control acid reflux is usually achieved by reducing the pH of the gastric juice by proton pump inhibitors. The patients were usually prescribed a 1 month course of a proton pump inhibitor, but in a few cases the medication was given for longer periods. What is surprising is that 24 patients, diagnosed with

pathological levels of GOR, opted to receive no medication and a further 3 did not attend for review. The most common reason for refusal of medication was an acceptance of the symptoms and an unwillingness to accept medication that might continue for many years. It is thought provoking that of the original 106 patients considered appropriate for referral only 16 were eventually treated with medication. At the present time, patients cannot be reassured that taking medication will influence the rate of erosion. The use of medication to control pathological erosion in patients with GOR seems worthy of a further investigation, but this should be deferred until small amounts of erosion can be measured accurately.

The specific answers to the questions posed at the beginning of this report are:

1. Only some patients presenting with pathological dental erosion should be investigated for GOR (*see below*).
2. Many patients, particularly those without symptoms, do not want to be tested.
3. Some patients with pathological erosion and GOR are symptomless.
4. Doctors will prescribe medication based on the results of the tests.
5. Patients, particularly those without symptoms, often do not wish to take this medication.

Closing the audit cycle

Based on the results of this audit it is suggested that the criteria for referral of patients with palatal dental erosion for 24 ambulatory oesophageal pH measurement should be:

1. Patients with palatal dental erosion whose symptoms of GOR are interfering with their quality of life. They should be aware a positive test may result in them being offered medication. If they are not amenable to medication from the outset, the value of the test should be questioned.
2. Patients who want to know the cause of their erosion irrespective of the presence of symptoms and the potential for medication.

3. All other patients should be reviewed by their dentists and this review should include serial study casts sometimes taken over a period of years. Where erosion progresses, despite restriction of dietary acids the question of a 24 h oesophageal pH test should be reconsidered.

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