but that they had been pleasantly surprised. The rehearsal of all the service lectures and most of the specialist lectures ensured the smooth running and continuity of the lecture course, the benefits of which were so apparent that we would recommend that this should form an important part of any lecture course. The use of key words on the second projector screen was certainly worth the extra effort required in the presentation. The examples classes were surprisingly successful in that the delegates enjoyed them and often completed them before the end of the session. This may have been helped by the intensely competitive temperament within this particular group. Others benefited from the one to one discussion that was possible because of the number of staff available during examples classes.

The prepared notebook was not as well used as had been hoped. It is easy to underestimate the skill required in taking lecture notes, especially when this problem is compounded by the use of a second language. The notebooks did, however, serve as a useful aide mémoire for the delegates to take home with them at the end of the course. Many of the delegates used cameras in the lecture theatre, and some even had miniature tape recorders. Perhaps this easily available technology could be used to reduce the need for taking notes on future courses.

The excursions to sights of historical interest were much enjoyed, and the ratio of one academic to two recreational days proved to be an acceptable balance. The tour guide was useful as he was able to advise us about the major subjects of interest within the touring party, and this resulted in an impromptu trip to St Andrews golf course. In retrospect we could have tailored the recreation more closely to the interests of our party if we had contacted the tour guide before their arrival. We certainly underestimated the Japanese interest in golf!

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Lesson of the Week

A difficult pain in the neck

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Dental disease is a recognised cause of pain in the neck but the underlying diagnosis is usually obvious because of associated symptoms related directly to the teeth. We describe a patient with a periapical dental abscess who presented only with pain and tenderness over his left carotid artery.

Dental disease should be considered in any patient with unexplained neck pain; periapical radiographs will often aid diagnosis

Case report

A 37 year old police officer with no history of neck trauma was admitted at his general practitioner's request complaining of excruciating pain in his neck. The pain occurred suddenly while he was washing his face. It started deep to the clavicular insertion of his left sternomastoid muscle, radiating both up the neck and to the left shoulder. It gradually resolved after a few minutes leaving a residual ache, only to recur suddenly with an associated tearing sensation deep to the body of the sternomastoid. Further exacerbations over the next two days compelled him to seek medical attention.

When admitted he was crying with severe pain and required intravenous diamorphine. The only physical finding was exquisite tenderness along the anterior border of the sternomastoid muscle. He was not feverish and his ears, nose, teeth, and throat were normal (although he was not examined by a dentist at the time). There was no facial swelling and all peripheral pulses were present with no bruits. Full blood count and autoantibody screen were normal, plasma viscosity was 1·89 mPa s (1·89 cP) (normal 1·50-1·72), and biochemical profile showed only raised γ-glutamyltransferase activity (120 IU/l; normal 0-50). An *x* ray picture of the cervical spine was normal and real time ultrasound scanning of his neck showed a left common carotid artery of normal diameter.

The pain initially persisted in hospital, requiring large doses of oral analgesics. Three days later an abscess underlying the first left molar spontaneously discharged into the patient's mouth and the pain resolved within minutes. A dental surgeon subsequently extracted the tooth under local anaesthetic and the patient was discharged the next day. He remained perfectly well at outpatient follow up and his general practitioner verified that he had not been readmitted to any other hospital requesting analgesia.

Discussion

Inflammation of the membrane surrounding the root of a tooth (periodontitis) and subsequent suppuration (periapical abscess) are well recognised complications of dental caries.[1] The diagnosis of a periapical abscess is based on symptoms such as pain and swelling and signs of tooth tenderness and gingival or facial swelling.[2] Periapical radiographs often show bone resorption, although they may be normal during the first week.[3]

Infection of soft tissues in the head and neck may complicate

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periapical infection.[4] After infection has penetrated the mandible it will follow the line of least resistance, tracking along fascial planes. It may rupture into the adjacent carotid sheath and therefore progress up and down the neck. This may produce pain and tenderness as described in the distribution of the carotid artery, but there are no recent reports of these symptoms in the absence of jaw pain.

Severe spontaneous carotid pain with tenderness along the course of the common carotid artery in the absence of infection or trauma constitutes the syndrome of carotodynia.[5] The clinical picture is similar to that described in our patient. Pain often radiates from the neck to the ipsilateral side of the face and ear. The affected carotid artery is noticeably tender and may be distended and hyperpulsatile. Fever is unusual and a raised erythrocyte sedimentation rate is often the only abnormal laboratory finding. The condition may be a variant of migraine and often responds to ergotamine compounds.[6] The differential diagnosis also includes dissecting carotid artery aneurysms,[7] which are usually seen on a real time ultrasound scan of the neck.

We thank Mr H S Dearing, associate specialist in dental surgery, for his help with this case.

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Biochemical Tests in Medicine

Measurement of urine 17-oxogenic steroids, 17-hydroxycorticosteroids, and 17-oxosteroids has been superseded by better tests

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It is more than 30 years since reliable colorimetric methods were introduced for the measurement in urine of metabolites arising from steroids secreted by the adrenal cortex. These measurements provided an invaluable replacement for time consuming bioassays and for the first time made it feasible for hospital laboratories to investigate patients with diseases of the adrenal cortex. The elegant innovation that made this possible[1-3] comprised selective oxidation and reduction of the urinary steroids followed by condensation of the products with 1,3-dinitrobenzene—the Zimmerman reaction. This formed the basis of the analysis for urinary 17-oxogenic steroids, 17-hydroxycorticosteroids, and 17-oxosteroids recommended by a working party of the Medical Research Council in 1969.[4] The analytical and interpretative problems associated with these methods have been reviewed.[5]

17-Oxogenic steroids represent metabolites of steroids secreted from the adrenal cortex, while 17-hydroxycorticoids largely represent metabolites of cortisol but also include a minor steroid subfraction (C21 methyl, C20 keto) not measured in the 17-oxogenic steroid assay. The two assays are virtually synonymous and are not distinguished in the rest of this article. 17-Oxosteroids are metabolites of steroids derived from both the adrenal cortex and the gonads. None of these assays is a good index of steroid secretion or reliable indicator of the biological activity of specific steroids secreted by the endocrine glands.

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I believe that urine 17-oxo and 17-oxogenic steroids should be deleted from the clinical chemistry repertoire. Consideration of some individual clinical conditions substantiates this point.

17-Oxogenic steroids/17-hydroxycorticoids

In patients with *Cushing's syndrome* the excretion of 17-oxogenic steroids is not always increased: for example, Crapo[6] found that 56 out of 235 such patients (24%) had normal daily excretion of these steroids. The assay of urine free cortisol or serum cortisol is more useful. Urine free cortisol excretion is of particular value as it parallels the cortisol secretion rate,[7] while measurement of serum cortisol at 0800 and 2400 will often disclose a loss in the circadian rhythm of cortisol. The best first line test for Cushing's syndrome, however, is the single dose overnight dexamethasone suppression test, since this has a low incidence of false negative results.[6]

When adrenal hyperfunction has been established adrenocorticotrophin plasma measurements will help to differentiate adrenal tumours from pituitary and ectopic sources of this hormone.

Measurement of 17-oxogenic steroids after the administration of metyrapone has long been advocated as a useful indirect test of adrenocorticotrophin release.[8] Supporters for retaining this measurement point to the metyrapone test and cite the difficulties and cost of performing assays for adrenocorticotrophin as the direct test of release of this hormone from the pituitary after metyrapone. The specific assay of serum 11-deoxycortisol, however, has been found to be a rapid, useful, and acceptable alternative for the indirect detection of adrenocorticotrophin release after metyrapone administration.[9]

Adrenal insufficiency may be due to destruction of the adrenal cortex or be secondary to impaired pituitary secretion of adrenocorticotrophin. In either case finding low or undetectable basal concentrations of cortisol in serum with absent or poor cortisol response to short term (30 minutes to one hour) administration of tetracosactrin confirms the diagnosis. To achieve comparable diagnostic information when urine 17-oxogenic steroids are measured

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