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The effectiveness of guidelines in reducing inappropriate CT scans of the paranasal sinuses*

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SUMMARY

An effective system for scoring pathological changes on CT scans of the paranasal sinuses has been developed by Lund & Mackay. We have performed an audit using 100 outpatients with nasal symptoms and found that adherence to guidelines prior to ordering CT scans of the paranasal sinuses correlates with an increased average Lund & Mackay score. Using these guidelines has also reduced the number of inappropriate CT scan requests.

Key words: CT scan, audit, rhinosinusitis, paranasal sinuses

INTRODUCTION

Nasal pathology is a major cause of morbidity in patients presenting to Ear, Nose and Throat departments (Kaliner et al., 1997). The diagnosis of intranasal pathology is primarily based on the history and examination; supplemented by the use of computerised tomography (CT) scans of the nose and paranasal sinuses (Lanza and Kennedy, 1997; Zinrich, 1997). In an effort to keep the number of inappropriate CT scans of the paranasal sinuses to a minimum, we have developed a set of guidelines to be followed by the clinician, prior to instigating this investigation. The effectiveness of these guidelines was audited by assessing the CT sinus pathology score as measured by the Lund & Mackay scoring system (Lund and Mackay, 1993).

MATERIALS AND METHODS

In the first cycle of the audit 50 consecutive outpatients presenting with nasal symptoms, to the Department of ENT at Lewisham University Hospital, underwent CT investigation of their paranasal sinuses using clinical suspicion alone. This decision to scan was unbiased by guidelines and the CT scans were scored by a Consultant Radiologist using the Lund & Mackay system (No identifiable pathology =0; Complete bilateral sinus opacification =24). A set of guidelines for CT scanning was then agreed upon and circulated to all clinicians in the Department (Table 1). A further 50 consecutive outpatients with nasal symptoms were selected for CT investigation on the sole basis of fulfilling one or more of the guidelines. (In the chronic rhinosinusitis group (guideline 1) the diagnosis was made solely on clinical grounds following history, examination and rhinoscopy).

Table 1. Guidelines for CT of paranasal sinuses.

(1) Chronic rhinosinusitis for more than 6 weeks despite full medical treatment
(2) The presence of unilateral or bilateral nasal polyps
(3) Anosmia
(4) The suspicion of a nasal tumour
(5) Suspected cerebrospinal fluid (CSF) leak

RESULTS

In the pre-guideline group, the mean Lund & Mackay CT score as determined by a consultant radiologist was 5.57. However, in the post-guideline group, the mean score increased to 8.62. This represents an increase in the 'hit rate' of 12.7% for intra-nasal pathology in the second loop of the audit cycle. The group of patients who had CT scans for nasal polyposis (guideline 2) had the highest mean Lund & Mackay score (15.8). The mean score for the chronic rhinosinusitis group (guideline 1) was 6.3 and for the anosmia group (guideline 3) was 6.2. There were no cases of nasal tumours or CSF leak (guidelines 4 & 5) in our study.

A subgroup of our study patients formed part of another departmental study in which detailed intraoperative data was collected. The intraoperative findings for these patients correlated with their Lund & Mackay score, such that patients with a high Lund & Mackay score also had extensive nasal pathology. Similar findings have been documented in other research studies (Kennedy, 1992; Casiano, 1997). In addition we found that

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patients with a high Lund & Mackay score were more likely to be listed for Functional Endoscopic Sinus Surgery (FESS).

DISCUSSION

The Lund & Mackay scoring system is used to assess the severity of sinus disease based on CT scanning of the paranasal sinus (Lund and Mackay, 1993). Plain sinus radiography gives little anatomical or pathological information, and this has largely been abandoned by otolaryngologists in favour of CT scanning, which may be regarded as the current gold standard.

In order to simplify the analysis and comparison of sinus CT scans a large number of scoring systems have been developed including the Harvard system (Gliklich and Metson, 1994); Moriyama system (Moriyama et al., 1991); Lawson system (Lawson, 1991) and Kennedy system (Kennedy, 1992). However, the Lund & Mackay system has gained wide acceptance in the UK because of its simplicity, effectiveness and ease of use, and for these reasons it was adopted for our audit.

Table 2. The Lund & Mackay scoring system.

Anterior ethmoid	0 = clear, 1 = partial opacification, 2 = complete opacification
Posterior ethmoid	0 = clear, 1 = partial opacification, 2 = complete opacification
Maxillary sinus	0 = clear, 1 = partial opacification, 2 = complete opacification
Frontal sinus	0 = clear, 1 = partial opacification, 2 = complete opacification
Sphenoid sinus	0 = clear, 1 = partial opacification, 2 = complete opacification
Osteomeatal complex	0 = clear or 1 = opacified

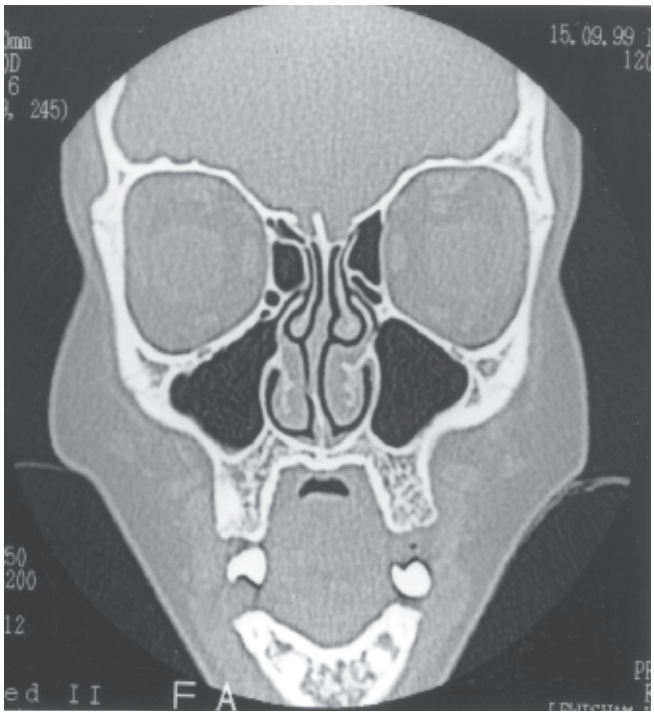

Figure 1. CT scan of paranasal sinuses. No mucosal disease, Lund & Mackay score=0.

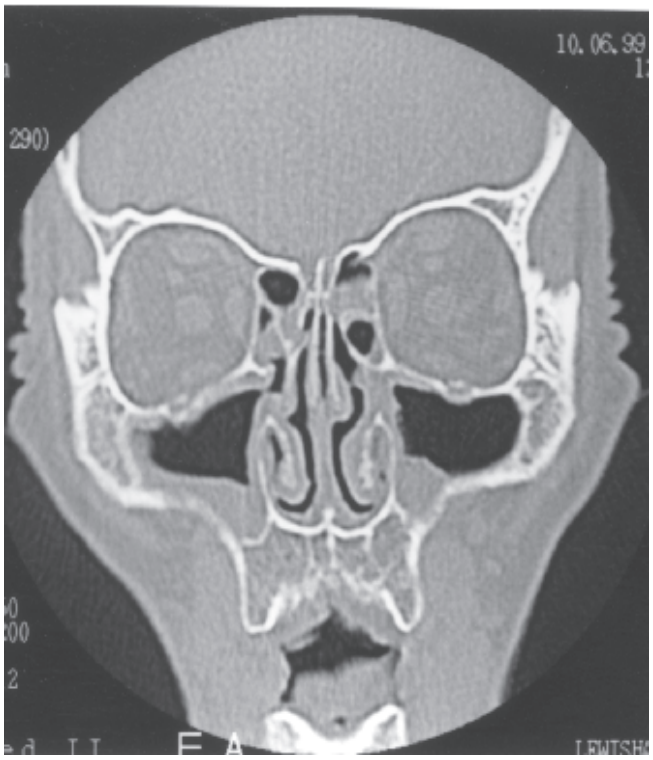

Figure 2. CT scan of paranasal sinuses. Moderate bilateral disease, Lund & Mackay score=8.

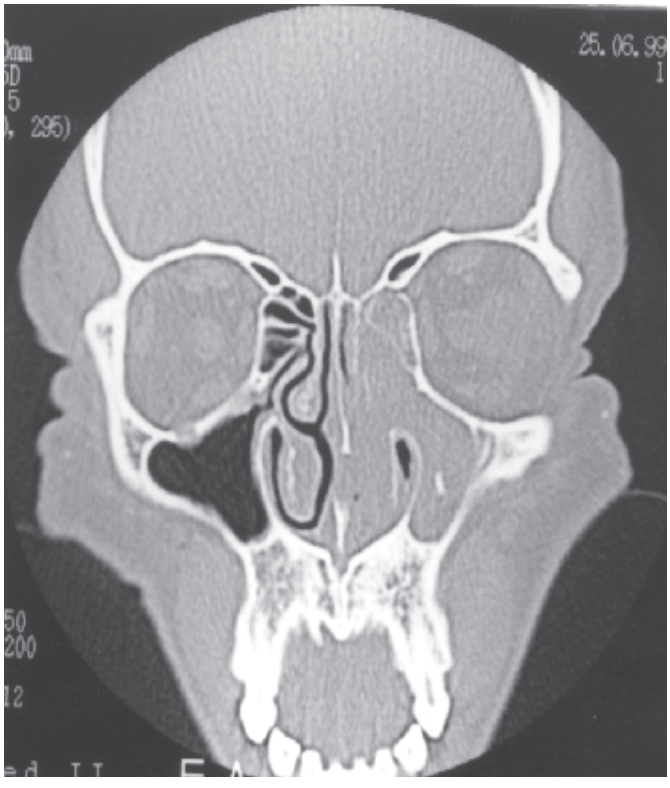

Figure 3. CT scan of paranasal sinuses. Extensive unilateral disease, Lund & Mackay score=12.

According to the Lund & Mackay system the osteomeatal complex (the final common pathway of drainage for most of the sinuses) and each of the five sinuses on each side is scored from 0 to 2 leading to a maximum score of 24, 12 on each side. See Table 2 and Figures 1 to 3.

This audit demonstrated that using guidelines in assessing the need for CT investigation in patients presenting with nasal disease improves the 'hit rate'. This will help to reduce the number of inappropriate CT scan requests in the outpatient setting. The benefit for patients is a reduction in unnecessary radiological investigations and thus radiation dose. There were also financial and manpower benefits for the Department of Radiology.

Recommendations for future practice include continued adherence to the guidelines, the re-audit of future practice and the education of new departmental personnel.

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ANNOUNCEMENT