LETTERS TO THE JOURNAL

Sir,

Living with a Scanning Laser Ophthalmoscope

The scanning laser ophthalmoscope (SLO) is a fascinating new development in the history of imaging the fundus oculi which few units in the United Kingdom have had the opportunity to assess. As a result of many requests for information I felt it would be useful to inform your readers of our experiences to date. The Rodenstock SLO was donated to the Eye Department at the Southern General Hospital, Glasgow as an aid to research and teaching, though it was accepted that it would have in addition a large clinical commitment. It employs a helium–neon laser or an argon laser to scan the fundus and the information is displayed on a TV monitor.[1] A U-Matic video recorder is connected to the system and a frame grabber is used to capture still frames from either the SLO or the video tape. It is expensive to purchase, costing about three times as much as a modern fundus camera, but the running costs are considerably lower, as several angiograms can be fitted onto one U-Matic tape and there are no development costs, against one film per angiogram plus development costs with a standard camera.

What are the Clinical Benefits of the SLO over a Standard Fundus Camera?

Some of the advantages are those of video systems in general:[2]

(*a*) In fluorescein angiography several people, and not just the photographer, can see the angiogram as it is being performed, which can have benefits in terms of directing the photographer to areas of special interest during the angiogram, as well as making it easier to train photographers or doctors in the techniques of fluorescein angiography.

(*b*) The result of an angiogram is instantly available so that it can be given to the patient at once, avoiding a return visit.

(*c*) If a patient requires treatment, a print-out of the necessary point or points on the video can be obtained by the frame grabber instantly.

(*b*) The angiogram can be reviewed dynamically. This is excellent for teaching, and means that a vital frame is unlikely to be missed. In one patient it also allowed emboli to be observed passing through the retinal circulation. These were very hard to see clinically.

What are the Advantages Specific to the SLO?

The specific advantages are:

(*a*) It can be used to view the fundus through an undilated pupil. For angiography this is not quite adequate, but a single instillation of tropicamide 1% is, whereas for flash fluorescein angiography stronger mydriatics are necessary.

(*b*) In some patients, in whom the pupil does not dilate well, this can allow an angiogram to be performed which would otherwise have been impossible.

(*c*) The angiogram is much easier for the patient. He or she merely has to watch a steady rectangle of light rather than be bombarded with a rapid series of bright flashes. Patients who have had previous angiograms with a conventional system find the SLO video system much easier to tolerate. In some this makes the difference of an angiogram being feasible in an otherwise intolerant patient.

(*d*) The SLO has a much greater depth of field than conventional photography.[3] This is useful in several instances. In reviewing diabetic retinopathy, for example, it is far less likely than other photographic methods to miss neovascularisation extending out of the plane of the retina. Retinal detachments may also be photographed more easily, and dynamically, with benefits both for teaching and for angiography where necessary.

(*e*) The SLO is much better at obtaining a view through hazy media such as a moderate amount of cataract. This is particularly true of the helium–neon laser used for ordinary fundal viewing, and we have had several cases where a fundal view was not obtainable clinically even with dilatation because of a fairly dense cataract but the SLO allowed an easy fundal view. Fig. 1 shows a macular hole which is so obvious on the SLO that it is hard to believe it was not visible clinically. This was found in a patient with

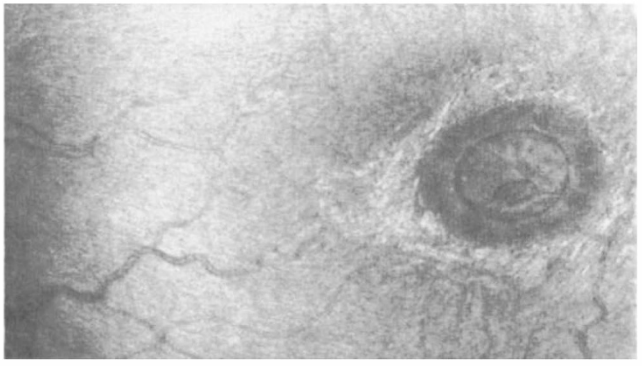

Fig. 1. Macular hole viewed through a dense cataract.

bilateral cataracts and the other eye showed no such defect, allowing a decision to be made to operate on the other eye first and so give the patient greater benefit. In a diabetic patient with cataract a clinical view of the fundus was too hazy to reveal an area of circinate retinopathy threatening but not reaching the fovea. This was easily visible with the SLO, allowing appropriate assessment of the urgency of cataract extraction for that patient. The SLO is thus truly an ophthalmoscope and not just a fundus camera.

(*f*) We have found that in some conditions the SLO avoids the need for fluorescein angiography. Cystoid macular oedema is so obvious that we have ceased to perform angiograms for this, and in two diabetics referred for assessment of the degree of retinal ischaemia, new retinal vessels which had not been obvious to two experienced clinicians were immediately apparent, so that angiography was not necessary.

(*g*) The SLO has a large research potential, partly because of the quality of the view, and partly because of the ease with which the system may be coupled to an image analyser for computer analysis of results.[4] Projects utilising this facility are now under way and will be reported in the near future.

What are the Disadvantages?

The disadvantages are:

(*a*) Because of increased technology the SLO is a little harder to use than a normal fundus camera initially, but this is offset by the fact that the teacher and student can see the picture simultaneously allowing corrective guidance to be given easily.

(*b*) The air cooling fan is a little noisier than in many fundus cameras, although one does get used to this.

(*c*) The cooling fan tends to blow dust particles onto the internal mirrors of the SLO and these require regular cleaning by trained personnel. This problem is being addressed by Rodenstock and may be improved on future models.

In conclusion, the scanning laser ophthalmoscope has already proved a great boon to our routine clinical practice. It has also opened up exciting new avenues for research.

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Sir,

The case report by Rose *et al.*[1] raises several important points regarding the management of orbital cellulitis.

The clinical diagnosis cannot be disputed. Sinusitis is the commonest cause of orbital cellulitis and may be revealed by sinus radiographs. However, a CT scan of the orbits is the investigation of choice[2] as it will demonstrate the sinusitis, outline the extent of orbital inflammation and identify an abscess. Furthermore it can be used to monitor the progress of the condition. If an abscess is identified it should be drained; under these circumstances the CT scan helps determine the surgical approach.[3] In the unusual case described a CT scan on admission may well have influenced the timing of surgery, the approach and the choice of antibiotics.

Haemophilus influenzae is rightly cited as a cause of orbital cellulitis in children. There is significant resistance of this species to ampicillin. Cefuroxime is the antibiotic of choice,[2,4] as it has good tissue penetration and a broad spectrum that includes beta-lactamase-producing bacteria. In adults cafotaxime is recommended as a first-line treatment;[2] however, cefuroxime in high doses will serve. Metronidazole is a sensible adjunct to cover anaerobes.

It is important to modify initial empirical antibiotic treatment in the light of cultures. *Streptococcus pneumoniae* is almost invariably sensitive to benzyl penicillin, and as infection was culture-proven it would have been sensible to add it to the regime. Ceftazidime and chloramphenicol seem an odd combination of cidal and static antibiotics. As with all cephalosporins there is *in vitro* evidence of antagonism with chloramphenicol.[5] Although the significance of this is unknown it is important to consider the possibility when treating serious infection.

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