

Corneal and Other Ocular Findings in Patients on Intermittent Dialysis for Renal Failure

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There has always been great interest in the ophthalmic condition of patients with renal failure. Visual symptoms due to retinal changes may, of course, be a prominent clinical feature of the disease. However, my attention to this subject came from a different direction. Fig 1 is a painting of the appearance of the cornea of the right eye of a patient with irritable red eyes, referred by the Renal Unit of the Royal Free Hospital where he is being treated for renal failure by intermittent dialysis.

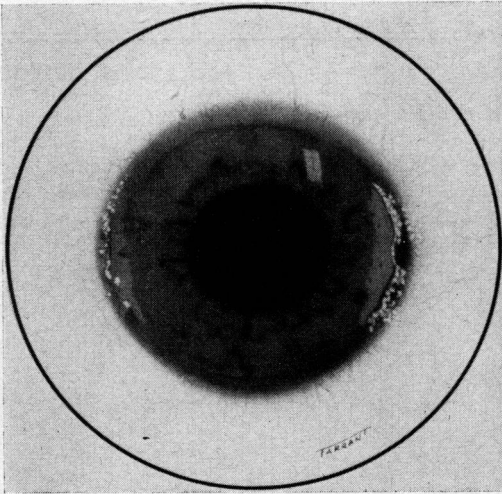


Fig 1

White deposits are present close to the limbus, mainly in the interpalpebral areas. They are extremely superficial and when first seen some had flaked off giving small eroded areas staining with fluorescein. The symptoms were soon relieved by padding the worst affected eye and by the instillation of a bland ointment.

I am indebted to Mr Henry Hobbs for referring me to descriptions of similar cases by Walsh & Howard (1947) and by Cogan *et al.* (1948).

I was, therefore, encouraged to look at the other cases of renal failure being treated by intermittent dialysis. There are, in fact, 20 patients at the Royal Free who are being kept alive by this technique. The periods of time the members of this group have been on artificial kidney treatment vary from three months to just under three

years. The subject who has had the longest period of treatment is a medical student at another London teaching hospital.

Nineteen of these intermittent dialysis patients were examined and a change in the corneas similar in degree to that shown by the original patient was found in 3 others.

Another 9 subjects showed lesser degrees of the same condition. Slit-lamp examination may suggest the clinical condition known as Vogt's white limbus girdle and amongst these 9 subjects, many of whom were perhaps too young to show this supposed age change, there were all gradations between a typical white limbus girdle and the obviously pathological appearance of the original subject.

In the more marked examples the corneal appearance is similar to that described in hypercalcaemia due to hyperparathyroidism, vitamin-D poisoning and sarcoidosis by Cogan *et al.* (1948). These authors state, however, that the appearance is readily distinguishable from the white limbus girdle. With this I disagree, and it is interesting to note that their descriptions of the corneas of uraemic patients with similar deposits can be put into two groups depending on whether or not there is a clear gap between the deposits and the limbus. The white limbus girdle also assumes different forms depending on the presence or absence of a gap.

If, as seems likely, the condition of these patients with renal failure is one of calcification it is difficult to relate it to any definite hypercalcaemia. There has been no consistent relationship to serum levels of calcium, phosphates or alkaline phosphatase. Nor has there been any detectable relationship to age, to duration of disease or to period on dialysis treatment. There has been no real evidence of secondary hyperparathyroidism in these patients; in fact, of 2 patients with bone disease, one has normal corneas and the other only a slight affection. It is particularly difficult to assess the role of blood chemistry because the biochemical state alters so markedly as a result of the dialysis.

For what it is worth, there is a slight distinction between glomerulonephritis and other types of renal failure, as far as corneal change is concerned. All 11 glomerulonephritics showed the change in some degree, and the 4 severely affected cases were amongst them. Only 2 of the remainder had any change and this was quite minor.

Perhaps this calcification is of the type occurring in abnormal tissue, the pathology of which is a hyaline change. Sugar & Kobernick (1960) describe such change as being the basis of the white limbus girdle. Whatever the nature of the lesions, I hope to have an opportunity to watch them over a long period of time.

The fundi of these patients are astonishingly normal. Thirteen of the 20 patients had malignant hypertension, many of them with severe visual symptoms; 9 showed Grade IV hypertensive retinopathy before dialysis treatment. After varying periods on dialysis, 8 of these 9 patients have normal vision, the ninth has early posterior cortical cataracts. Of the 13 patients with malignant hypertension originally, only 3 now show any significant fundus abnormality in the form of oedema, either of the disc or the macula. Even this appears to be subsiding.

Perhaps the most remarkable feature of this return to normal of severely affected fundi is the fact that only one of these patients has a significantly raised blood pressure; the others have normal blood pressure without any antihypertensive therapy. It seems that the control of water and electrolyte levels given by the artificial kidney goes a long way to normalizing the blood pressure. It is also, of course, likely that during dialysis hitherto unknown noxious substances which directly affect the cardiovascular system are filtered off.

Summary

A corneal change has been found in 13 out of 20 patients being treated by intermittent dialysis for renal failure. The change varies in degree from those patients showing an appearance closely

resembling Vogt's white limbus girdle to those, 4 in number, in whom the clinical picture is that of corneal calcification.

Intermittent dialysis for renal failure associated with malignant hypertension often leads to the restoration of normal blood pressure without specific antihypertensive therapy; the fundus changes present initially, often Grade IV in severity, resolve almost completely as a result of this treatment, with return of normal vision.

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The subject was **Afterthoughts of Practice**, and the speakers were Mrs Dorothy Campbell, Mr O M Duthie, Mr G G Penman, Mr A B Nutt and Mr H Campbell Orr.