CLINICAL RECORDS

SUDDEN DEAFNESS

By A. S. DE B. COCKS (Adelaide)

A NUMBER of authors have referred to a group of cases under the heading of "sudden deafness" with or without some qualification such as "idiopathic" or "in young people". Whereas the term is unsatisfactory and far too embracing in its scope it has, by common consent, been restricted in its application to the type of case described in this paper.

The group of cases is exemplified in regard to age, history and the extent of the hearing loss by the following four cases culled at random from records of patients encountered before the present mode of treatment was commenced.

CASE I. *21-6-44*. Mr. D. V., aged 32 years, was awakened during the night by a loud bang in the right ear, three months ago. He has not been able to hear in this ear since. No vertigo.

CASE II. *23-2-45*. Mrs. L. R., aged 46 years. On rising one morning a year ago, she was assailed by a noise like a train whistle in the left ear. She has not heard other than a loud shout in the ear since then. No vertigo.

CASE III. *1-9-51*. Mrs. D.B., aged 27 years. While hanging out clothes four days previously, she noticed a sudden deafness and a noise like a stream of air passing through the left ear. No vertigo.

CASE IV. *17-7-51*. Mr. C. D., aged 37 years. Awakened this morning with a blocked left ear and a hissing tinnitus. No vertigo.

A composite audiogram (Fig. 1) shows the hearing curve in the affected ear

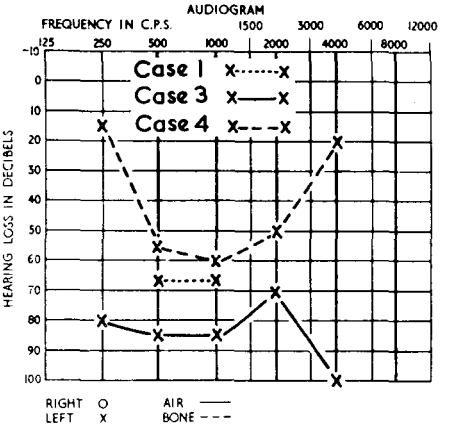


FIG. 1.

Case 1. x . . . . . x Case 3. x————x Case 4. x – – – – – x

https://doi.org/10.1017/S0022215100060825 Published online by Cambridge University Press

of these cases with the exception of Case II, in whom no response could be obtained at the maximum output of the audiometer.

There is no characteristic curve of hearing loss and the early morning seems to be a time favoured by the condition to strike. Atypical forms occur in which some degree of vertigo is present. This may even be the leading symptom. Such atypical forms tend to occur in the older patients in the group.

No patient had previously experienced an attack of a similar nature. There seems to be no reason why the second ear should not become involved and reports of such cases are to be found in the literature.

Edmund P. Fowler (1950) in analysing some 60 of these cases, including 26 of his own, advanced the suggestion that the condition was caused by sludging of the blood in the cochlear vessels. He advised treatment by the intravenous administration of Novocaine and concluded by saying that "If our experience and our theories are correct it may be possible in early cases to relieve sudden deafness".

The writer was attracted by the views expressed by J. C. Seymour (1954) concerning the blood circulation in the cochlea. In 1959 the opportunity of observing some of this work presented itself and it was kindly and clearly demonstrated by Dr. Seymour at the Ferrens Institute. Contraction of the smooth muscle of the precapillary sphincters in the *stria vascularis* induced by vasoconstrictors was shown virtually to arrest the blood flow through the capillary system. This spasm persisted for hours in laboratory animals until relieved by vasodilators.

It is generally acknowledged that the efficient functioning of the organ of Corti is dependent upon a high level of oxygen tension in the endolymph of the cochlear duct.

A fanciful notion then began to take shape. If, by reason of a spasm of the precapillary sphincters (or a similar mechanism) the oxygen tension in the endolymph were lowered to a critical level would some of the specialized cells in the organ of Corti suddenly cease their function? Having done so, could they remain in a state of suspended animation, as it were, on a reduced but steady oxygen supply for a certain length of time? Would the cells revive and function be restored if a full flush of blood ran through the capillary system before irreversible changes had taken place?

It was decided to put the matter to the test not knowing that Wilmot (1959) was working with the same or a similar object in view.

The first case (Case V) presented in *September, 1959*. Mrs. F.C., aged 45 years, had lost the hearing in her right ear eighteen years beforehand in consequence of a suppuration in that ear. At 3.45 a.m. on *September 22nd* the patient was awakened by a terrifying noise in the head. There was some transitory vertigo. She was not able to hear the raised voices of her family at all. At the time of her examination, speech was quite unintelligible to her.

A left stellate ganglion block was carried out at 8.30 p.m. using 1 per cent. Novocain. By next norning her audiogram had improved a little but the outstanding feature was the improvement in the comprehension of speech. The patient was sitting up in bed happily conversing with her nurses in complete contrast to her agitation of the previous day. Subsequent recovery, which was maintained when last seen four months later, is depicted in Fig. 2.

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The next case (Case VI) was that of Mr. A. R., aged 52 years, who was first seen on *October 3rd, 1960*. Nine days beforehand he had been awakened in the early morning by a noise in the right ear. His hearing which had been good was now defective and an annoying diplacusis developed. There was no vertigo, in

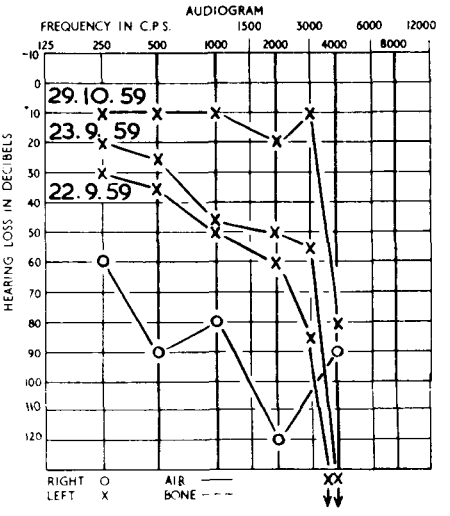


FIG. 2.
Case V.

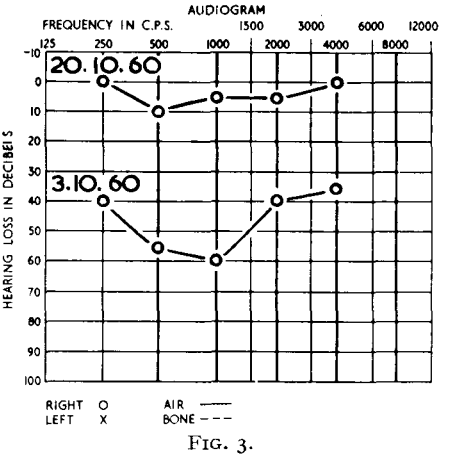


FIG. 3.
Case VI.

fact the patient journeyed 60 miles and played a game of golf on the first day. A right stellate ganglion block was carried out on *October 4th* with improvement in hearing and disappearance of the diplacusis (Fig. 3).

Case VII, Mr. A.R.W., aged 49 years, had been awakened 5 weeks beforehand by a "terrific" ringing in the ears and a loss of hearing on the left side. A

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left stellate ganglion block carried out on *October 12th, 1960*, did not result in any improvement in the hearing (Fig. 4).

Case VIII, was that of a medical practitioner aged 42 years, who had been overworking for many months. At 11 a.m. on *March 30th, 1962*, he noticed the

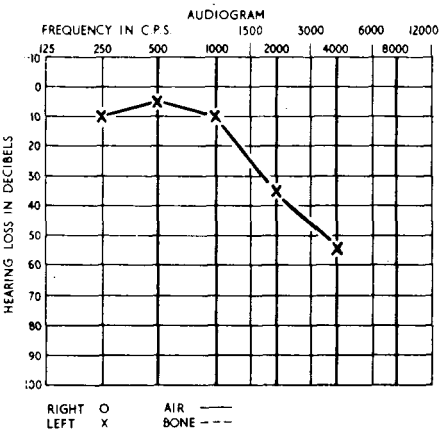


FIG. 4.
Case VII.

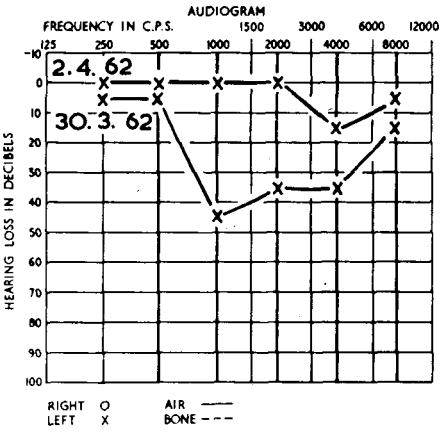


FIG. 5.
Case VIII.

abrupt onset of tinnitus in the left ear which persisted for a few minutes and then ceased. Half an hour later it suddenly returned together with deafness and diplacusis. He was reduced to using his stethoscope in a monoaural fashion but finally gave up and sought advice. He was prevailed upon to spare the time for a left stellate ganglion block which was carried out with the patient almost literally on the run. His audiogram is depicted in Fig. 5.

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Case IX was 59 years of age, the wife of a physician. Two weeks before seeking advice the patient had been sitting down playing bridge when she experienced a sensation of slight giddiness which increased over a period of two hours and was later accompanied by nausea and vomiting. These completely incapacitating symptoms persisted for 48 hours and were followed by a period of unsteadiness which continued for several weeks. It was not until the day after the onset that the patient noticed a deafness in the left ear. An audiogram taken on *July 12th, 1962* shows the extent of the hearing loss at the end of the second week of the illness (Fig. 6). A left stellate ganglion block was carried out

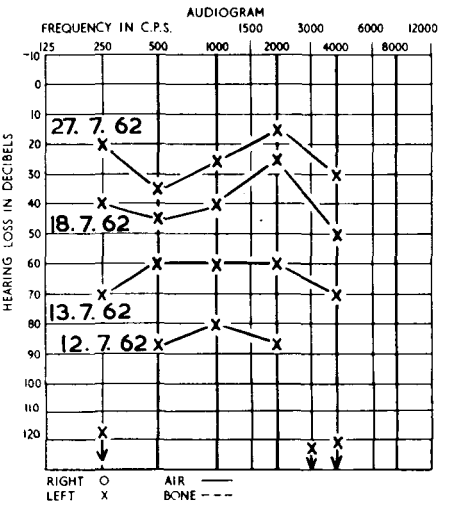


FIG. 6.
Case IX.

on that day and repeated on *July 20th*. The hearing recovered in a step-like manner to a fairly satisfactory level. Discrimination lagged behind the pure-tone audiogram and it was not until mid-*August* that the patient could readily understand speech through the telephone when using the affected ear. This patient was hypertensive (B.P.200/100) with somewhat tortuous radial arteries and slightly narrowed retinal vessels. It is doubtful if she could be described as a "typical" case but the response was gratifying.

Case X was also atypical. Miss C.S. was an 18-year-old girl suffering from otosclerosis, having an approximate 35 to 40 decibel loss in both ears. She was a wayward child who had left a respectable home. Her parents hoped that if her hearing were restored she might become more tractable. On *February 26th, 1962*, a right stapedectomy (vein graft) was carried out with closure of the air bone gap. This recovery had been maintained until *May 16th* when post-operative supervision ceased.

On *June 11th*, while listening to television, the patient noticed that her hearing became less acute. On the following day at 2.30 p.m. she suddenly

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noticed that she could not hear her workmates' voices on her right side. The right stellate ganglion was blocked on three occasions on alternate days (Fig. 7).

The final case (Case XI) was, not unexpectedly, a complete failure. Mrs. T.M.B., aged 54 years, was seen on *September 6th, 1962*. Nine weeks beforehand she had been awakened at 4 a.m. with nausea, vomiting and giddiness. The following day she noticed that her right ear was deaf. At the time of her examination no tones could be heard in the affected ear at any frequency at the full output of the audiometer. At the patient's request her stellate ganglion was blocked but there was no response.

All cases received treatment with buphenine hydrochloride (perdilatal) in doses of 6 mg. four or five times a day.

This is a very small series of cases. They are published with a three-fold objective. First to confirm the prediction of E. P. Fowler that it may be possible

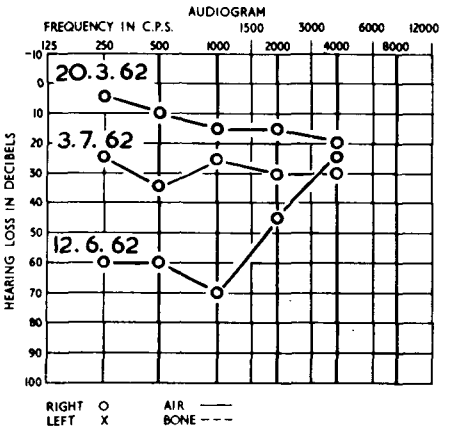


FIG. 7.

Case X The uppermost curve represents the hearing following stapedectomy.

to relieve some cases of sudden deafness. Secondly to support the plea of Wilmot that patients suffering from this mishap should be referred to an otologist at the earliest moment. These cases should be treated as a medical emergency.

Unfortunately casualty officers or general practitioners frequently send such patients to a medical ward or to a physician respectively where a diagnosis of "labyrinthitis" or Ménière's disease is made. When the accompanying vertigo (if any) has been relieved all parties except the patient are satisfied. The latter is sometimes sent on his way with the advice to adjust himself to his tinnitus and deafness because nothing can be done about it. This is cold comfort.

Thirdly this paper provides the opportunity to comment on the views of Bosatra and D'Stefani (1961). The authors survey the history and literature of the subject and report 47 cases with a full discussion of the causes and treatment of the condition. Heparin, nicotinic acid, acetylcholine, novocain, histamine and (in late cases) cortisone were employed according to the authors' appreciation of the needs of the case. In 12 cases "direct ultrasonic destruction

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of the labyrinth" was employed. In only one of the published audiograms is the patients' hearing recorded as recovering to a level above the 30 decibel line throughout the speech frequencies. This patient was treated by acetylcholine alone. The following statement is made with reference to "early stage cases"—

> "Our experience suggests that the best therapeutic results can be obtained by intravenous administration of heparin in large doses or of acetylcholine (or any other similar compound) and, should medicinal treatment fail to produce results worthy of note within one week, by direct ultrasonic irradiation."

Of the seven cases referred to in this paper and treated by stellate ganglion block, three recovered virtually normal hearing, two recovered to the 30 decibel level (obtaining useful hearing) and there were two failures.

The submission is made that these results in a regrettably small series of cases may, not withstanding, encourage the employment of this relatively simple and innocuous method before embarking on more major procedures.

Summary

The syndrome of sudden deafness is illustrated by four cases. The response of seven cases to treatment by stellate ganglion block is described. Five of the seven cases recovered useful hearing and there were two failures.

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