CASE NOTES

VACCINIA OF THE CONJUNCTIVAL SAC*

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SINCE the introduction of vaccination as a therapeutic measure in 1796, between 200 and 300 cases of accidental infection of the eyelids, conjunctiva, or cornea have been reported. Doubtless more have remained unreported or unrecognized. In some cases the edges of the eyelids alone were involved, in others the conjunctival sac was involved, either primarily or secondarily from the eyelids. Corneal involvement is stated by various authors to occur in from 10 to 30 per cent. of cases, in some instances with dire result to the eyes. Ocular infection by vaccinia may occur in two ways :

- (i) by auto-inoculation of the eye from a vaccination pustule elsewhere in the body. These run a more favourable course than the second type.
- (ii) by infection of the eyes, in such people as mothers and nursemaids, by contamination from a case of recent vaccination.

The disease is self-limiting and the virulent inflammation usually subsides in about 10 days.

According to Duke-Elder (1938) corneal involvement takes three forms :

- (i) marginal infiltration of the cornea which becomes vascularized and clears up.
- (ii) true vaccinal pustule, commencing after an incubation of one to five days, with ulcer formation. This is a serious affair and follows a long and painful course.
- (iii) disciform keratitis, which, after a slow course, may clear up entirely.

Atkinson and Scullard (1940) state that when the cornea is involved, the inflammation usually takes the form of disciform keratitis, central in position and often accompanied by serous iritis.

Case Report

History.—A woman, aged 33, came under my care 4 days after the onset of the disease. The first sign she had noticed was a small white pustule on the bulbar conjunctiva, near the plica semilunaris of the right eye. The condition had progressed by the next day and she therefore sought advice. Penicillin, in the form of drops and ointment, was prescribed, but the condition grew steadily worse and next day was affecting an area of the bulbar conjunctiva about 5 mm. in diameter, while there were now several small secondary areas of infection on the inner surface of the upper lid near the lacrimal punctum. The whole of the conjunctival sac was hyperaemic and there was a small amount of sero-mucinous discharge. A scraping of the ulcer revealed no organisms on culture. She received 1 g. streptomycin parenterally twice daily and ung. aureomycin locally.

The patient had a small child who had been vaccinated 14 days before the first sign noted by the patient in her own eye. At this time the vaccinated area in the child was

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still showing considerable ulceration. The patient herself had last been vaccinated 15 years earlier. When the case came under my care she was admitted to hospital with a diagnosis of vaccinia of the conjunctival sac.

Examination (4th day).

Right Eye : Eyelids oedematous, but could be opened fairly easily manually. Irregular ulcer of bulbar conjunctiva, about 10 mm. in diameter, near plica semilunaris. Several areas of ulceration present on conjunctival surface of upper lid at inner end. Conjunctival surface of lower lid, at inner end, had become involved and several small ulcers were present there also. Edges of ulcers slightly raised and bases covered by adherent greyish white sloughs. Moderate chemosis of conjunctiva. Submaxillary, cervical, and pre-auricular lymph glands all enlarged. Cornea appeared unaffected.

Left Eye : Normal. It remained unaffected throughout.

Treatment.—500 mg. intravenous vitamin C, followed by 200 mg. vitamin C daily by mouth. Locally, irrigations with freshly-made solutions of potassium permanganate (1 in 100,000), vitamin C drops, and ung. aureomycin at 4-hourly intervals.

Course of Disease: 5th day.—Bulbar ulceration extended to limbus, but cornea clear. Ulcerated areas of lids adherent to bulbar conjunctiva. Attempted separation by means of a glass rod was extremely painful and had to be abandoned.

6th day (Morning).—Lids very oedematous and indurated at inner ends. Right side of face also oedematous. Upper cervical, submaxillary, and pre-auricular lymph glands enlarged and very tender. Eye intensely sore. As the lids could only be opened by means of retractors, the patient was examined under pentothal anaesthesia. Examination revealed ulceration of all the nasal side of the bulbar conjunctiva. The inner half of the conjunctival surface of the lower lid and the inner one-third of the conjunctival surface of the upper lid were also ulcerated. The bulbar conjunctiva, where not ulcerated, was so chemotic as to overhang the cornea. The cornea itself showed a matt surface, but no gross changes were visible in the parenchyma. The treatment was continued and, in addition, Penicillin G (500,000 units) and Distaquaine-G (300,000 units) were given as a prophylactic against secondary infection. At 2 p.m. 20 ml. specific immune serum were given intramuscularly.

7th day.—Eyelids less swollen, with a freer discharge of sero-mucinous fluid. Sloughs beginning to separate; lymph glands much less tender. Corneal surface mat with a slight haze of the parenchyma. A further 10 ml. immune serum were given intramuscularly. A culture taken at this time remained sterile.

8th day (Morning).—Swelling of face less and lymph glands less swollen, especially the pre-auricular lymph gland, which was not now tender. Sloughs separating and chemosis of conjunctiva less. Slight muco-purulent discharge from conjunctival sac. Cornea slightly hazy, with a small central infiltrated yellow area. Local treatment, with addition of atropine drops, continued, and "Distaquaine" again given.

(Evening).—Long, thin, central, sinuous area of cornea stained with fluorescein dye, with a yellowish, infiltrated area above and below. Conjunctival sac otherwise cleaner and chemosis less. Patient experienced slightly increased discomfort, with pricking sensation in the eye.

9th day.—Much pain experienced during previous night. Lids slightly more swollen. Corneal appearance unchanged. Conjunctival sac again cleaner, but with some sero-fibrinous discharge. Some adhesion present between ulcerated areas of lids and bulbar conjunctiva. 10 ml. specific immune serum given intramuscularly. Previous local treatment discontinued, except for atropine drops. The conjunctival discharge washed away with normal saline lotion. Immune serum drops given locally at hourly intervals until midnight, when they were continued at four-hourly intervals.

10th day.—Original staining area of the cornea now no longer stained, but a smaller linear area was staining in the upper part of the cornea. Immune serum drops continued at hourly intervals.

11th day.—Cornea did not stain with fluorescein macroscopically, but there was still a haze of the parenchyma, with grey lines visible, probably at the level of Descemet's membrane.

12th day.—Corneal surface bright. There was still a parenchymatous haze. Two small opacities marked site of ulcerated area in upper part of cornea, but there was no staining with fluorescein dye.

13th day.—Eye generally less inflamed. Lids opened easily. Slit-lamp examination revealed some patchy opacities of the corneal epithelium. Parenchyma showed faint general haze and

there were folds in Descemet's membrane. Pupil wide. No synechiae present. As the immune serum drops were now finished, treatment consisted of irrigations with normal saline lotion and atropine drops.

From this stage the patient made an uninterrupted recovery with no serious sequelae.

Discussion

It is dangerous to draw conclusions from a single case, especially in a disease self-limiting by nature. The question to be decided is twofold:

- (1) has any treatment influenced the course of the disease, or is it in fact a natural cure;
- (2) if the treatment was of material benefit, to which of the therapeutic agents used is this benefit to be ascribed.

With regard to the first point, the length of time which the acute stage lasted may suggest that the evidence is inconclusive. It may be pointed out, however, that the infection was severe, and serious doubts were entertained at one time regarding the fate of the eye. Furthermore, the patient having last been vaccinated 15 years previously, no increase in general immunity was to be expected from this source, as in cases of auto-inoculation. It might be presumed, therefore, that the disease would run its full course. Perhaps the significant feature of this case is that when immune serum was given on two occasions a striking improvement occurred in the clinical condition. The first, which consisted of 30 ml. serum given in two doses intramuscularly, produced immediate improvement in the condition of the conjunctival sac, although it failed to prevent a moderately severe infection of the cornea. The second, consisting of immune serum drops, with 10 ml. immune serum intramuscularly, produced an immediate improvement in the corneal condition. It is known that virus infections of the cornea may run a prolonged course, and apparently vaccinia is no exception. In this case, not only did the corneal lesions clear up relatively soon, but there has so far been no further trouble, over a year after the infection was contracted.

As regards the other therapeutic agents, vitamin C, potassium permanganate solutions, and aureomycin, the disease progressed in spite of their exhibition. Recently King and Robie (1951) have reported good results from aureomycin, and it is possible that aureomycin by mouth might have had more effect in this case.

It is suggested that there is *prima facie* evidence of benefit obtained from the use of specific immune serum. It is important to give the serum in the form of drops locally, to prevent corneal infection, as well as intramuscularly, to benefit the conjunctival condition.

The immune serum, which was obtained from the Virus Reference Laboratory, Colindale, London, was prepared in 1943 by the Lister Institute, from a pool of plasma from recently vaccinated young adults.

REFERENCES

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