A chest wall swelling due to inhaled grass

J. T. HARRIES

M.B., B.S.(Lond.), M.R.C.P., D.C.H.

Senior House Officer, Department of Child Health,

Welsh National School of Medicine

R. C. HARTLEY

Ch.M.(Birmingham), F.R.C.S.

Senior Surgical Registrar,

United Cardiff Hospitals

T. E. PARRY

M.B.(Manchester), M.R.C.P., F.C.Path.

Consultant Pathologist,

Department of Clinical Pathology,

Llandough Hospital, United Cardiff Hospitals

DESPITE frequent contact, inhalation of grasses is a rare occurrence in childhood. In a high proportion of the recorded cases the inhaled foreign material was an inhaled inflorescence (flower or seed head) which had tracked through the lung parenchyma, the pleura and the chest wall, to present as a swelling, either in relationship to a rib or in the subcutaneous tissue. Jackson (1952) reported eighteen cases and reviewed seventeen others from the literature. Of these thirty-five cases, the inflorescence had reached the subcutaneous tissue in twenty-eight. Choremis *et al.* (1964) described two cases which had followed a similar course and reviewed forty-five cases of grass inhalation. A further case was described by Naylor (1966). The inhaled inflorescence had tracked through the chest wall in no fewer than thirty-two of the forty-eight cases reported to date.

The present case is reported in view of the rarity of the condition and because of its relatively silent clinical course.

Case report

A female child aged 22 months was admitted to hospital as an emergency with a 2-week history of cough and irritability. For 48 hr prior to admission she had been vomiting and the stools had been loose. Apart from a 'chest infection' 4 months previously, her health had been good. There was no history of any inhaled foreign material.

Examination revealed a well-nourished, flushed and irritable child; the temperature was 39.5°C. Scattered rhonchi were present over both lung fields.

Investigations. Haemoglobin, 60%; MCHC, 26%; ESR, 70 mm/hr (Westergren); WBC,

20,000/mm³; polymorphs, 74%; lymphocytes, 10%; monocytes, 4%; eosinophils, 12%; platelet normal. Throat and rectal swabs did not yield any pathogenic organisms on culture. Blood urea, electrolytes, urine analysis and bone marrow biopsy were all normal. Portable X-ray film of the chest revealed no obvious abnormality.

The day following admission a small firm immobile tender swelling measuring 1 × ½ in. was noticed over the right sixth rib in the mid axillary line. Crepitus was elicited over the lump but there were no signs whatsoever of penetration of the overlying skin. A second chest X-ray showed a soft tissue swelling containing gas. A diagnosis of osteomyelitis or of cellulitis due to a gas-forming organism was made. Treatment with systemic penicillin and erythromycin was commenced. Blood culture remained sterile after 14 days incubation. The patient became afebrile and the crepitus disappeared. The swelling, however, remained unaltered and was explored surgically 24 days after admission when a cystic lesion was removed from the subcutaneous tissues of the right chest wall. It was adherent to the superficial intercostal muscles but not to bones. On section, in the theatre, it was at first thought to contain hair.

The subsequent clinical course was uneventful.

Pathology. The material submitted for examination consists of a firm ovoid mass measuring 1½ × 1 cm (Fig. 1). A tuft of vegetable-like material resembling a 'head of barley' is present in the same container.

Histology. Voluntary muscle together with vascular granulation tissue. The latter shows well-marked inflammatory infiltration consisting mainly

FIG. 1

of polymorphs together with considerable numbers of eosinophils as well as small numbers of plasma cells, lymphocytes and small giant cells of the foreign body type. The appearances are consistent with this being the wall of a fairly chronic abscess. The foreign material consists of vegetable matter covered by a purulent exudate containing small foci of calcification.

Discussion

Our case illustrates the cardinal features of inhaled grass inflorescence. It occurs in young children. A history of the original incident is often lacking, although our patient had a 'chest infection' 4 months prior to admission. Pneumonic symptoms may follow the inhalation but suppurative lung lesions are rare. Abdominal pain at this stage may lead to an unnecessary laparotomy. Chemical irritation, so common after the inhalation of nuts, is not encountered. Finally, surprisingly few symptoms and signs accompany penetration of the pleura and chest wall, both empyema and pneumothorax being decidedly rare.

In our case, the diagnosis of osteomyelitis of the rib, fracture of the rib, cellulitis due to a gas-

forming organisms and dermoid cyst were all considered.

Jackson (1952) has correlated the behaviour of inhaled grasses with their botanical structure and recognizes two types, the 'lodging' and the 'extrusive'. The former consists of timothy grasses whose spikelets are soft, compact and lose their rigidity on wetting. They lodge in the bronchial tree and have to be removed with the bronchoscope. In contrast, the extrusive type belong to the barley grasses whose sharp spikelets are set at an acute angle on a rigid stem. These impart an element of self-propulsion towards the periphery of the lung, aided by contraction of the chest wall and bronchial tubes. Eventually they penetrate the chest wall as in the present case. Prognosis, as a rule, is excellent.

On the few occasions where the inhaled grasses have been identified botanically, *Tristenum flavescens*, *Hordeum murinum* and *Sorghum vulgare* have been incriminated. The material in the present case was identified as the 'Common Wall Barley' by Dr Mary S. Percival of the Department of Botany of the University College of South Wales and Monmouthshire.

Summary

A case of chest-wall swelling due to inhalation of the extrusive variety of grass is reported. The difficulties of diagnosis are discussed.

Acknowledgments

We wish to thank Professor A. G. Watkins of the Department of Child Health, Welsh National School of Medicine, for permission to publish this case, Professor J. Gough for reading the manuscript and Dr Mary S. Percival for identifying the grass.

References

- CHOREMIS, C., THEODOROU, S., ATHANASIADES, T. & KATERELOS, H. (1964) Spontaneous elimination of inhaled grass inflorescence through the lung and chest wall. *Arch. Dis. Child.* **39**, 406.
- JACKSON, C. (1952) Grasses as foreign bodies in the bronchus and lung. *Laryngoscope (St Louis)*, **62**, 897.
- NAYLOR, A. (1966) Spontaneous elimination of inhaled inflorescence presenting as dorsal tumour. *Brit. med. J.* **i**, 524.