CASE REPORT

Nasal septal ulceration and perforation in jiggers

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The paper describes two cases of occupational ill-health in individuals working as jiggers in the chromium electroplating industry. Much has been written about the effects of chromic acid on the platers who may work directly over the plating baths, but a literature search failed to identify any reports of ill-health in those who work alongside platers preparing the items to be placed into the baths. One case of nasal ulceration and one of nasal septal perforation are described. Reference is made to the role of the 'responsible person' in health surveillance for such workers to allow early identification of occupationally acquired ill-health and prevention of further cases.

Key words: Chromium plating; jiggers; nasal perforation; nasal ulceration.

INTRODUCTION

Reports of ill-health in workers involved in chrome plating include dermatitis, nasal irritation, ulceration and perforation, asthma and cancer of the lung. Legge reported ulceration and perforation of the nasal septum in chrome platers as early as 1902. Hunter described the time interval from first exposure to chromic acid to the development of such conditions as between 6–12 months in working platers. Nasal perforations have also been documented as occurring within weeks after initial exposure with ulcers reported after only a few days of plating work. Dermatitis has been reported both in a number of studies in platers in the UK and in Singapore and among electroplaters generally in EPI-DERM, the UK occupational disease reporting system. Non-occupational causes of nasal septum ulceration and perforation include local trauma, cocaine abuse, lupus, post-submucous resection and granulomatous disease.

One group working alongside platers who have not received the same degree of attention are the jiggers — the workers who prepare the items prior to plating by attaching items to be plated onto jigs (frames). In some cases it is necessary for items to be wired into position, other items may be suspended covered in masking tapes to selectively plate the underlying metal. Years ago jigging and plating were two distinct jobs, but now they may be undertaken by the same person although some workplaces still exist where the two jobs remain separate.

Described below are two cases of occupational ill-health in jiggers in the chrome plating industry who came to the notice of the Employment Medical Advisory Service in the Birmingham offices of the Health and Safety Executive (HSE) within a 10-month period between June 1995 and March 1996.

Case 1: Nasal perforation

HSE received notification under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations, 1985 of a 30-year-old right-handed female jigger employed in the manufacture of aerospace components who had worked at a chrome plating factory since August 1994. After 5 months in the post a routine examination by the factory doctor (following complaints of nasal irritation) revealed a 1 cm perforation in the nasal septum. Initially described as a scab in the right nostril, the lesion had perforated within a matter of weeks. There was no previous exposure to chromium salts or chromic acid prior to this employment and no non-occupational risk factors or behaviour.

Examination of the work environment revealed no obvious direct exposure to chromium solutions — the jigger worked adjacent to the automated hexavalent chromium (VI) plating shop but in a separate section. Chromic acid mist over the plating baths was controlled to below the maximum exposure limit (MEL) of 0.05mg/m³ by mist suppressants which form a blanket over the surface of the solution. Levels were measured.
on a fortnightly basis as required by the Control of Substances Hazardous to Health Regulations 1988. Investigation revealed that the open door of the plating shop blew air through and into the jig section over her work area but the investigating inspector, following an interview of the worker and her colleagues, concluded that it was more likely that the perforation had occurred because of direct contact of a contaminated finger with the nasal septum rather than from inhalation of fugitive chromic acid emissions as the mist appeared to be well-controlled and confined to the baths. Contamination of the hands and fingers however had occurred from handling wet components in the jigging and de-jigging process and the worker admitted to picking her nose whilst at work.

In this case there had been no formal or informal health surveillance as it had not been appreciated that this individual was exposed to chromic acid solutions. No other employees in the work area were experiencing symptoms.

Case 2: Nasal ulceration
A 17-year-old male trainee jigger was employed in a plating company since September 1995 (after leaving full-time education). Three months after starting work he developed sharp pain in the nostrils accompanied by a mucous blood-stained discharge. Initially he attributed the pain to ‘growing pains’ and did not report the symptoms to his employer or his GP. Two months later the symptoms had not resolved so he reported them to his employer who arranged for him to be examined by a ‘responsible person’. The examination, conducted 5 months after he had started work, revealed an ulcer on the nasal septum. He was removed from work in the plating area and was referred to his GP who confirmed the diagnosis and prescribed naseptin ointment (naseptin contains chlorhexidine and neomycin and is used for the eradication of nasal carriage of staphylococci). The company reported the case to the Health and Safety Executive under RIDOR 1985. When reviewed in April 1996 by the Senior Employment Medical Advisor (NW) examination revealed a healed right nasal septal ulcer. There was no previous exposure to chromium compounds and no non-occupational risk factors identified. Investigation of the work environment and work practices revealed no direct work over or near to the baths containing hexavalent chromium — they were located approximately 5 feet away from the jiggers work area and raised 3–4 feet above the ground. Fortnightly air monitoring above the baths indicated that the chromium mist was adequately suppressed to below the MEL. There was no health surveillance in operation because it was not perceived that this employee was exposed to chromium solutions; however, his hands were heavily contaminated with chromium during the preparation and unloading of the jigs through the application and removal of masking tape. He recalled that he had experienced irritation of his nose when he first started work and that he had rubbed his nose both with contaminated hands and against the sleeve of his protective, but contaminated, overalls.

DISCUSSION
These two cases illustrate that the well-documented medical conditions which occur in chrome platers also occur in the jiggers working alongside them. A review of several medical databases, NIOSHTIC, CISDOC, HSE line, Medline and Embase for all publications up to the end of 1996 revealed no published research on jiggers or ‘wirers-up’; however, a recent paper by Bright et al. lists a female jigger as one of seven cases of occupational asthma attributed to ‘chrome’ (presumed to be hexavalent chromium) exposure.

The annual report of the Chief Inspector of Factories 1949 recognized that jiggers could experience ill-health — the report details 139 cases of chrome ulceration in the industry as a whole of which 23 cases were of ulceration of the nasal septum and the remainder, ulceration of the fingers or hands. The report states that ‘nine cases (seven of them females) were employed only as “wirers-up” and should not normally have come into contact with solutions’. It was found, however, that in one factory where five of these cases occurred, the metal parts to which articles were wired for plating were inadequately cleaned; in another case, the plastic composition covering the jigs had deteriorated, allowing contamination by solutions’.

A study by Cohen et al. reviewed personal hygiene practices among workers at one electroplating facility. They found that wearing internally contaminated gloves, wiping the face and picking the nose, not wearing any personal protective equipment and not removing gloves in a manner which prevents contamination of the skin were all seen during the study.

In the two cases described above the individuals themselves linked the development of their symptoms...
with direct contact exposure of their nose or skin with chromic acid. This was confirmed as likely by the investigators and supported by environmental monitoring results.

Employers and occupational physicians need to be aware of the possibility of direct contact of chromium solutions with the nose and the subsequent development of occupational ill-health when carrying out their risk assessments and implementing control strategies. Good environmental control of chromic acid mists over the baths needs to be accompanied by high standards of personal hygiene if nasal lesions are to be prevented.

Employees who may be exposed directly or indirectly to chromium (VI) solutions, need to be made aware of significant symptoms and of the need to report them to a suitable trained responsible person at the earliest opportunity. This ‘responsible person’ needs to be adequately trained both in the recognition of abnormal signs and symptoms (but not their diagnosis) and the actions required following the detection of positive findings.

ACKNOWLEDGEMENTS

The author would like to acknowledge the contribution of Mrs L. Shelmerdine of EMAS, HSE Birmingham in the investigation of these cases.

REFERENCES