

## British Contact Dermatitis Society: Summaries of Papers

### CD-1

#### Shocking reactions to 'Shock-waves' hair mousse: allergic contact dermatitis to 3-iodo-2-propynyl-butylcarbamate

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3-Iodo-2-propynyl-butylcarbamate (IPBC) is an effective biocide and fungicidal agent. It was originally used as a wood preservative and more recently has been approved as a cosmetics preservative, at a maximum concentration of 0.1%. It is currently used in a wide range of products including shampoos, creams and make-up. There have been four previous reports of allergic contact dermatitis from IPBC due to cosmetic use: three from cosmetic creams (Bryld LE, Agner T, Menné T. Allergic contact dermatitis from 3-iodo-2-propynyl-butylcarbamate (IPBC) – an update. *Contact Dermatitis* 2000; **43**: 234–40); and one from sanitary wipes (Schollnast R, Kranke B, Aberer W. Anal and palmar contact dermatitis caused by iodopropynyl butylcarbamate in moist sanitary wipes. *Hautarzt* 2003; **54**: 970–4). We report three patients allergic to IPBC, who developed florid scalp dermatitis, associated with alopecia, after using a hair mousse containing IPBC.

Patient 1, a 29-year-old nurse, presented with a 3-month history of scalp irritation. This had progressed to a florid eczematous eruption over her whole scalp, ears and neck, associated with diffuse hair loss. She required admission to hospital for treatment with topical steroids and emollients. Patch testing revealed a positive reaction to IPBC, D2–/D4+. IPBC was a component of the 'Shock-waves curl<sup>®</sup>' hair mousse that she had used daily for the previous 2 years.

Patient 2, a 29-year-old teacher, had used 'Shock-waves curl<sup>®</sup>' hair mousse for 4 weeks before she developed an eczematous rash over the scalp and ears, associated with patchy hair loss. Her scalp and hair growth recovered after avoiding the hair mousse and with use of topical steroids. Patch testing revealed a positive reaction to IPBC, D2+/D4+, and to the hair mousse, D2+/D4+.

Patient 3, a 51-year-old opera singer, presented with a 6-month history of recurrent neck and scalp dermatitis associated with hair loss. Patch tests revealed a positive reaction to IPBC, D2–/D4+. She had a history of using 'Shock-waves curl<sup>®</sup>' hair mousse. The condition has not recurred since she has avoided its use.

The British Contact Dermatitis Society cosmetics battery includes IPBC, at 0.1%. IPBC is used in an increasingly large number of cosmetic products. We would like to highlight the importance of continued testing with IPBC and the dramatic clinical reactions that IPBC allergy can cause.

### CD-2

#### Patch testing to plastics: epoxy resin is the major allergen; pick-up rate is low for the extended series

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We have reviewed our experience of patch testing to plastics allergens over a 3-year period. The department's electronic patch test database was searched from January 2001 to December 2003. In total, 1072 patients were patch tested to the British Contact Dermatitis Society (BCDS) standard series over this time period. All positive allergic reactions to epoxy resin and *p-tert*-butylphenol-formaldehyde (PTBF) resin were recorded. Twenty-six of these patients were also patch tested to an extended plastics series and of these all positive reactions were recorded.

There were six positive reactions to epoxy resin, three of which were relevant. Eight positive reactions were seen to PTBF resin, one of which was relevant. Eight positive reactions were recorded in the plastics series. One positive reaction was recorded for each of methylhydroquinone, benzoyl peroxide, triphenyl phosphate, triethylene glycol diacrylate, butyl acrylate and urethane diacrylate. There were two positive reactions to hydroxyethyl methacrylate. The reactions were thought relevant in three cases, namely to benzoyl peroxide, triphenyl phosphate and hydroxyethyl methacrylate.

Overall, 0.6% of our patients who were patch tested to the BCDS standard series over the 3-year period had a positive reaction to epoxy resin: of these half were considered relevant. Regarding PTBF resin, 0.8% of patients overall were positive but only one of eight positive reactions was thought relevant. For the extended plastics series, tested in 26 subjects, eight were positive of which three were considered relevant. These figures agree with the patch test experience to the BCDS standard series at other British centres (Britton JER, Wilkinson SM, English JSC *et al.* The British standard series of contact dermatitis allergens: validation in clinical practice and value for clinical governance. *Br J Dermatol* 2003; **148**: 259–64), in which 28% of patients tested to an extended plastics series showed positive reactions, of which 50% were thought relevant.

Hence, epoxy resin seems to be the predominant plastics allergen. The extended plastics series is useful for selected cases but the pick-up rate of relevant positives is quite low.

**CD-3****Two cases of occupational allergic contact dermatitis to *p*-aminophenol in pharmaceutical workers manufacturing paracetamol**

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Patient 1, a 41-year-old man, was referred to the Contact Dermatitis Investigation Unit with a 6-month history of an intermittent facial dermatitis. There was no past history of skin disease or atopy. He had worked as a powder blender for a pharmaceutical manufacturer for 18 months and was involved in the production of paracetamol. The work environment was extremely dusty. The dermatitis improved when he took time off work or when he went on holiday.

He was patch tested to our standard series, face series and the pharmaceutical powders he came into contact with at work. He had ++ allergic reactions to *p*-phenylenediamine (PPD, 1% pet.), *p*-aminophenol (PAP, 1% pet.) and *m*-aminophenol (1% pet.). There was no reaction to paracetamol itself.

Patient 2, a 35-year-old man who worked for a different pharmaceutical manufacturer, was referred because of a 2-year history of a dermatitis affecting his hands, forearms and face. He was employed as a process worker in the production of paracetamol powder. There was a consistent relationship between his symptoms and being at work. He was patch tested and had a ++ allergic reaction to PPD (1% pet.) and + allergic reactions to PAP (1% pet.), *p*-aminoazobenzene (0.25% pet.) and disperse orange 3 (1% pet.). There was no reaction to paracetamol itself.

The PAP was felt to be relevant as it is a breakdown product of paracetamol under moist or wet conditions at room temperature. The other positive results were felt to be cross-reactions. PAP is a *p*-amino compound structurally related to PPD, but is less allergenic. Both patients denied previous exposure to hair dyes.

Interestingly, despite working in different sites both patients reported that the factory floors where the paracetamol was processed had a black discoloration. This is supportive of there being significant quantities of *p*-amino compounds present in the working environments of these individuals.

Dry pure paracetamol is a white odourless bitter-tasting crystalline powder and is very stable at temperatures up to 45 °C but under humid conditions hydrolysis to PAP takes place. The PAP is then degraded through oxidation characterized by colour change to pink, then brown and eventually black. The presence of aspirin, codeine and magnesium stearate facilitates this change.

Delayed hypersensitivity to paracetamol has been reported in four cases where systemic allergic contact dermatitis appears to have been caused by either oral or rectal administration of the drug. Patch tests with paracetamol in these cases showed allergic reactions.

Allergic contact dermatitis due to paracetamol is rare, and it is important to consider breakdown products as responsible allergens in individuals who are exposed to paracetamol in the pharmaceutical industry.

**CD-4****Occupational contact dermatitis from 2,4-dinitrofluorobenzene**

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A 53-year-old chemical plant technician presented with an acute and generalized dermatitis requiring inpatient treatment with topical clobetasol propionate 0.05% ointment and a course of oral corticosteroids. Two days earlier he had developed an eruption on his right knee. A week prior to this he had dismantled a vessel containing chemicals used in the manufacturing of pesticides. He had initially worn a butyl suit. A colleague had cleared a blockage in the vessel and he had returned to re-assemble the vessel, only wearing overalls, under the impression that no hazardous chemicals were present. Patch testing was performed 3 months after the incident with samples provided by the company. He was patch tested to an extended British standard series and a cosmetics/preservatives series as well as to 2,4-dinitrochlorobenzene (DNCB) and 2,4-dinitrofluorobenzene (DNFB) at a range of concentrations (0.0001%, 0.001% and 0.01% in acetone). He had a positive reaction to 0.01% DNFB only, graded + at day 2 and ++ at day 4.

DNFB is used as an intermediate in the synthesis of pesticides (algicides) and some pharmaceuticals such as flurbiprofen (a nonsteroidal anti-inflammatory drug). It is also used as a sensitizing agent and hapten in laboratory immunology and as a reagent (Sanger's reagent) to identify the terminal amino acids in a protein chain. To our knowledge, this is the first report of allergic contact dermatitis to DNFB in the pesticides industry. Garcia-Perez reported a case of contact dermatitis in a research biochemist provoked by Sanger's reagent (Garcia-Perez A. Occupational dermatitis from DNFB with cross sensitivity to DNCB. *Contact Dermatitis* 1978; **4**: 125–7). In this case the initial tests with DNFB were negative but further testing with freshly prepared material was positive. The author postulates that the high instability of the reagent, producing skin sensitivity only when freshly prepared, explains the surprisingly few cases of this occupational dermatitis considering its widespread use in biochemical research. DNCB causing allergic contact dermatitis is well described. Adams *et al.* reported four cases of contact dermatitis in air-conditioning repair men due to DNCB used as an algicide for cooling water (Adams RM, Zimmerman MC, Bartlett JB. 1-Chloro-2,4-dinitrobenzene as an algicide. Report of four cases of contact dermatitis. *Arch Dermatol* 1971; **103**: 191–3). Finally, Garcia-Perez reports cross-sensitization between these dinitrobenzene derivatives. This did not occur in our

patient, who showed a positive reaction to DNFB but not to DNCB.

### CD-5

#### The new competency-based curriculum in contact dermatitis: a pragmatic approach

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Higher specialist training in dermatology has recently evolved, and specialist registrars (SpRs) who started after January 2003 are now using a new competency-based curriculum. Prior to its publication, we were aware of the need to refine the training in contact dermatitis (CD), and evaluated our own training programme. We produced a single-page 10-point checklist, so that the objectives were clear and workable to both trainee and trainer. We felt this pragmatic approach to be an efficient way to achieve competence in CD.

Over a 9-month attachment the SpR and consultant share three clinical sessions each week. Day 0 (Monday) comprises two lists, one of which consists of patients referred for patch testing (by dermatologists) and the other of referrals (by general practitioners and hospital practitioners) for allergy assessments. Day 2 (Wednesday) is a shared list and a mixture of patients with occupational-related pathology and general dermatology. Day 4 (Friday) is final reading for the patch test (PT) patients, and under direct observation of the consultant the SpR interprets and communicates the relevant information from the PTs to the patient.

These clinical sessions provide the setting for the SpR to demonstrate competency in the key areas of CD. These are: (i) to identify the indications and limitations of the PT; (ii) to appreciate which PT series of allergens are available, and to be able to prepare appropriately allergens including the patient's products for PT; (iii) to distinguish between allergic and irritant reactions; (iv) effectively to communicate the meaning of positive reactions and their relevance to the patient; (v) to identify the different clinical presentations of CD; (vi) to interpret data sheets and regulations on control of substances hazardous to health; (vii) to know the immunological basis of CD; (viii) to appreciate the chemistry of PT allergens; (ix) to understand and perform immediate allergy testing (radioallergosorbent tests and prick tests); and (x) to write mock medicolegal reports on a template for occupational dermatology cases.

Assessment takes the form of case note reviews after independent consultations on days 0 and 2, and direct observation on day 4. Question and answer sessions reveal if the SpR is acquiring core knowledge.

Our single-page checklist is not as exhaustive as the published curriculum but contains aspects the published curriculum does not. We hope this presentation will add to

the debate on how best to achieve and assess competencies within the subspecialty of contact dermatitis.

### CD-6

#### Natural rubber latex allergy: impact on lifestyle and quality of life

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The prevalence of type 1 natural rubber latex (NRL) hypersensitivity in healthcare workers in Wales has been reported as 0.5% (Chowdhury MMU, Statham BN. Natural rubber latex allergy in a healthcare population in Wales. *Br J Dermatol* 2003; **148**: 737–40). Although not common, it mainly affects those who are regularly exposed to latex, particularly healthcare workers, and can therefore have a marked impact on their lives.

Our study aimed to assess the impact of NRL allergy on employment and lifestyle of individuals after diagnosis. It is also the first Dermatology Life Quality Index (DLQI) measurement for latex allergy.

Fifty consecutive latex-allergic patients from two centres (positive prick test 1997–2003) were questioned about their quality of life (DLQI questionnaire) and changes in lifestyle following their diagnosis. There was a 72% response rate.

Twenty-six people regularly worked with latex at the time of diagnosis, of whom 21 had received help from their employer to obtain latex alternatives. Most staff switching to latex-free gloves noticed an improvement in their symptoms. However, nine patients had changed the nature of their work as a direct result of their NRL allergy. This contrasts with a study of latex-allergic healthcare workers in Finland, none of whom changed their work because of their allergy (Turjanmaa K, Kanto M, Kautiainen H *et al.* Long-term outcome of 160 adult patients with natural rubber latex allergy. *J Allergy Clin Immunol* 2002; **110** (Suppl. 2): S70–4).

The mean DLQI score was 11/30. The prediagnosis mean DLQI score was 18, so indicating improvement, although this was a retrospective measurement. A record of specific symptoms and associated food allergies was also made.

One finding of concern was the lack of knowledge by the patients' doctors and dentists in dealing with their latex allergy. A third of those questioned had encountered ill-informed staff, one patient having to bring her own latex-free gloves to appointments.

The results of this study illustrate that medical and dental professionals still lack awareness of this serious condition. Some patients have experienced significant impairment of their quality of life as a result of their allergy. Therefore, earlier consideration and investigation of the diagnosis of NRL allergy in these patients is of great importance.

**CD-7****Hand eczema in healthcare workers and the value of a joint occupational health/dermatology clinic**

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The prevalence of occupational skin diseases is high among healthcare workers (HCW) (Chowdhury MMU, Statham BN. Natural rubber latex allergy in a healthcare population in Wales. *Br J Dermatol* 2003; **148**: 737–40). Figures from Leeds published in *Epiderm* in December 2002 revealed that 43% of cases of occupational dermatitis were seen in HCW. Over a 3-year period from January 1999 to December 2001, 99 HCW were referred to our unit for patch testing.

The male:female ratio was 14:85. Sixty-five of 99 had eczema affecting their hands and 76 of 99 had eczema elsewhere. Forty-seven of 99 had either asthma or atopic eczema. Patch tests were positive in 49 of 99 (49%), with relevance in 16 cases. An occupational cause was thought to be possible or probable in 59 of 99 HCW (60%); most were secondary to irritant contact dermatitis. The source of referral was mainly general practitioners, dermatology colleagues and a joint occupational health/dermatology clinic.

Irritation from glove use was high. Unpublished data (1997) suggested a prevalence of natural rubber latex (NRL) allergy of 7.6% in certain groups of HCW with 'high glove wear' in Oxford. A joint clinic held monthly was set up in 1999 to provide rapid access to staff with suspected occupational skin diseases. A retrospective case note survey was undertaken to assess attendances at this clinic from 1999 to 2002, and a questionnaire was sent to staff seen. In total, 116 patients had been seen, of whom 77 (66%) had hand eczema (HE). Other diagnoses included facial eczema, lichen planus, psoriasis, postscabetic itch, tinea, pityriasis lichenoides chronica, chilblains, keratolysis exfoliativa, pruritus and dermographism. Four had positive prick tests and were considered to have NRL allergy. Patients with severe HE or with occupational exacerbation of HE were referred for patch testing ( $n = 36$ ) and are part of the group analysed in the study. Of the remainder, 77 (66%) were discharged after a single visit. Forty-nine of 95 (52%) questionnaires were returned. Of these, 46 HCW attended consultation and 34 found the consultation useful.

Hand eczema is common in HCW. The prevalence of latex allergy among our earlier study is significant. The occupational health/dermatology clinic was found to be useful.

**CD-8****Patch testing with the shoe series: a 10-year review**

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The shoe series is used for suspected contact allergens in cases of foot or combined hand/foot dermatitis. It had been observed that allergic positive readings from the extended

shoe series appeared to be infrequent. We audited our results to see whether this was indeed the situation, to consider the continued use of the shoe series, and to make recommendations for future testing.

Computerized patch test data have been kept since 1994. These data were supplemented by reviewing patient records or letters to assess whether positive results were relevant.

From 1994 to 2003, 3337 patients were patch tested, 230 to the extended shoe series. Thirteen patients had positive results from the shoe series (6%), with 15 positive results.

Of the 230 patients tested to the shoe series, 44 (19%) tested positive to relevant allergens in the British Contact Dermatitis Society (BCDS) standard series. One hundred and sixteen patients were patch tested to the shoe series from 1994 to 1998, when the preservative, vehicle and medicament series were used as additional series. Nine had a relevant positive reaction to the medicament series (8%) not detected by the BCDS standard and shoe series. One hundred and fourteen patients were tested to the shoe series from 1999 to 2003, when the clothing/dye series became the usual additional series, to which one patient (1%) had a relevant positive result not identified by the BCDS standard and shoe series.

The current shoe series consists of 17 allergens, including two from the rubber series. Five allergens were positive in at least 1% of the 230 cases. Four allergens were positive in 0.4% of cases. It is worth considering removing the eight allergens from the shoe series to which there were no positive reactions in any of 230 patients tested over 10 years. These were diaminodiphenylmethane, 2,2,4-trimethyl-1,2-dihydroquinoline, 1H-benzotriazole, *n*-dodecylmercaptan, glutaraldehyde, acid yellow 36, diethylthiourea and diphenylthiourea.

We propose that the clothing/dye series is not routinely tested in all patients with foot or hand/foot dermatitis; disperse red 1 could be added to the shoe series. In addition, testing to additional corticosteroids would appear to be helpful.

**CD-9****Six years of testing to a dental contact battery**

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Type IV hypersensitivity to mercury is thought to cause oral lichenoid reaction (OLR) occurring adjacent to amalgam restorations. The role of other dental allergens in the pathogenesis of OLR has not been comprehensively explored.

Between December 1996 and September 2002, 154 patients were referred for patch testing to a variety of dental allergens. All were also tested to a standard battery.

There were no reactions to the dental battery in 94 patients (61%). Within this group, OLR was present in 28 patients, discomfort in 15, oral/lip swelling in 10, oral ulcers in nine, angular cheilitis in three, orofacial granulomatosis in three, lip eczema or irritation in two, other diagnoses in 14 and nonoral disorders in 10.

Sixty patients (39%) had positive reactions to the dental battery, which were thought to be relevant in 35. Complete data were collected for 33 of these 35. OLR occurred in 28, two had oral ulceration, and urticaria, oral/lip swelling, keratotic lesions of the mouth, difficulties with metal dentures, and nonlichenoid changes of the right buccal mucosa and tongue each occurred in single patients.

Twenty-two (63%) of those with relevant positive dental patch tests reacted to mercury, 13 (37%) to palladium and nine (26%) to gold. Three patients reacted to 2% eugenol and three to 2% methylhydroquinone.

Fourteen of these 35 patients underwent short contact testing to common flavourings and preservatives. Six of the 14 reacted to both cinnamic aldehyde and benzoic acid. After dietary avoidance, symptoms of OLR resolved completely in one of four patients suffering from OLR and improved in the remaining three.

The most common coallergens in the dental patch test-positive group were nickel, fragrance mix, cobalt and benzocaine with frequencies of 33%, 13%, 10% and 6%, respectively.

Amalgam replacement was undertaken in 17 patch test-positive patients suffering from OLR. Symptoms resolved in 10 (59%) and improved in five (29%).

Our findings confirm type IV allergy to mercury to be a common cause of OLR. Allergy to palladium is also common in a significant minority, but as most of these patients also reacted to mercury, the relevance of palladium as an allergen is not clear. Improvement of OLR after dietary avoidance of cinnamic aldehyde and benzoic acid was an unexpected finding. As many patients with OLR do not develop positive patch tests, it appears that allergy is not the only cause of this disorder.

## CD-10

### Patch testing in the elderly: is it worthwhile?

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The incidence of patch test reactivity depends on prior exposure, with few studies evaluating elderly subjects. The aim of our study was to address this issue. We reviewed results in elderly patients (defined as  $\geq 65$  years) who attended for patch testing over a 5-year period from January 1999 to December 2003. Patients were patch tested to an extended European standard series and additional series depending on clinical presentation.

Results showed that 322 (16.4%) of 1968 patients patch tested were elderly, 196 women (60%) and 126 men (40%). Balsam of Peru (*Myroxylon pereirae*) was the commonest sensitizer among men (21 of 126; 16.7%), followed by fragrance mix in 10 subjects (7.9%), neomycin in seven (5.6%) and carba mix in seven (5.6%). Nickel was the most frequently occurring contact allergen in women (32 of 196; 16.3%), followed by fragrance mix in 19 (9.7%), thiuram mix

in 19 (9.7%), carba mix in 15 (7.7%) and balsam of Peru in 14 (7.1%). Leg dressings were a common source of allergic contact dermatitis (ACD) in our elderly population, with 19 (5.9%) patients reacting to dressings *per se*. Notable cosmetic allergens among women were Amerchol L101 and butyl hydroxyanisole (each 2.6%). Uncommon allergens in this elderly group were ethylenediamine (0.3%), mercaptobenzothiazole (0.3%), chlorocresol (0.3%) and fusidic acid (0.3%).

Investigation of ACD in a multicentre study of all age groups in the U.K. (Britton JER, Wilkinson SM, English JSC *et al.* The British standard series of contact dermatitis allergens: validation in clinical practice and value for clinical governance. *Br J Dermatol* 2003; **148**: 259–64) reported nickel as the commonest allergen at 18.6%, followed by fragrance mix (10.7%) and balsam of Peru (6.7%). Our study shows nickel and fragrance mix reactions to be lower in this elderly population at 11.5% and 9%, respectively, balsam of Peru positivity being higher at 10.9%.

This study suggests that patch testing in elderly patients remains a worthwhile investigation yielding significant positive results; relevance to the underlying clinical problem should be determined in each case.

## CD-11

### Contact allergy to topical corticosteroids in inflammatory bowel disease

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Topical steroids in the form of enemas are used in the treatment of inflammatory bowel disease of the distal colon, sigmoid colon and rectum. Corticosteroids can cause contact dermatitis, and the incidence of contact allergy can vary from 5 to 15% (Boffa MF, Wilkinson SM, Beck MH. Screening for corticosteroid contact hypersensitivity. *Contact Dermatitis* 1995; **33**: 149–51). In patients with inflammatory bowel disease the development of contact sensitivity to topical steroids may lead to failure to respond to treatment or to deterioration in the condition.

Six patients (three men and three women, mean age 50 years) with inflammatory bowel disease who were using topical steroid enemas were investigated. None of the patients received immunosuppressants or oral steroids. Patch testing was performed to the British Standard battery, a steroid series (Chemotechnique®), prednisolone 1% and 0.1% in white soft paraffin and prednisolone 1% and 0.1% in isopropyl alcohol. The steroid battery included budesonide, betamethasone valerate, triamcinolone, tixocortol pivalate, aclometasone dipropionate, clobetasol propionate, dexamethasone and hydrocortisone butyrate. Ethical approval was obtained for the trial and patch testing was performed having obtained written informed consent.

One patient of the six had a + reaction to prednisolone 0.1% and 1% in isopropyl alcohol at 96 h. She also had a + reaction

to budesonide and tixocortol pivalate, fragrance mix, nickel, balsam of Peru and 1,2-dibromo-2,4-dicyanobutane. She described worsening of her symptoms since using the enemas. She has had a flare of her ulcerative colitis so it is impossible to assess yet whether cessation of the enemas has been beneficial. A recent report in the literature documents a case of steroid allergy in a patient with Crohn's disease who had a ++ positive reaction to budesonide at 72 h. Cessation of steroid enemas resulted in a huge improvement in the patient's condition (Monk BE, Skipper D. Allergy to topical corticosteroids in inflammatory bowel disease. *Gut* 2003; **52**: 597).

Five patients did not show sensitivity to steroids and given one patient's positive reaction to budesonide, tixocortol and prednisolone, we believe that this represents another case of steroid allergy secondary to prednisolone enema use in a patient with inflammatory bowel disease.

### CD-12

#### **Contact allergy to methylmethacrylate in bone cement and a survey of bone cement handling procedures in Scottish orthopaedic surgery**

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A 40-year-old female orthopaedic theatre staff nurse presented with a 6-month history of five episodes of redness, itching and peeling of the skin. During the final two episodes there was also alteration of the voice. Onset of symptoms occurred within a few hours of participation in surgical procedures requiring her to mix bone cement, and improved after 2 days. She wore two pairs of either latex or neoprene gloves and mixed the cement in an open bowl, kneading the resulting mixture with her gloved hands. The principal bone cement used consisted of a powdered polymer and a liquid monomer containing both methylmethacrylate and *N,N*-dimethyl-*p*-toluidine.

Patch tests were performed to the British Contact Dermatitis Society standard series, a variety of rubber additives, a commercial latex extract, *N,N*-dimethyl-4-toluidine, benzoyl peroxide, hydroquinone, gentamicin and methylmethacrylate. At both 48 and 96 h there were strongly positive reactions to methylmethacrylate; the only other positive reaction was to nickel.

As this nurse appeared to have developed allergy to methylmethacrylate as a result of occupational exposure, we were interested to assess bone cement handling policies and the incidence of methylmethacrylate allergy in Scottish hospitals.

Questionnaires were sent to all Scottish occupational health physicians and charge nurses in every orthopaedic department in Scotland. Replies were received from 17 (74%) charge nurses and eight (53%) occupational health physicians.

Eleven (65%) orthopaedic charge nurses reported routinely handling bone cement; four (24%) of those also kneaded it. Ten (59%) reported that they 'double gloved' with latex gloves. All orthopaedic surgeons routinely handled bone

cement and all 'double gloved' with latex gloves. The majority of departments used a closed mixing system; however, two used an open bowl system. Only one centre reported previous methacrylate allergy in theatre staff.

Of the eight replies from occupational health physicians, three trusts reported a written policy for handling and mixing bone cement and one had performed a control of substances hazardous to health assessment; one trust had 'recommendations' and another a 'procedure' but no written policy.

We highlight the need for continued awareness of the potential for methylmethacrylate to cause contact allergy. Although no surgical gloves are completely impervious we discuss those which have best withstood testing. Rigorous safety measures are appropriate if occupational allergy to methylmethacrylate among orthopaedic theatre staff is to be avoided in future.

### CD-13

#### **Nail acrylates: an important cause of contact dermatitis in both nail technicians and their clients**

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Sculptured artificial acrylic nails are becoming increasingly fashionable in the U.K. Acrylics are thermoplastic resins that polymerize either at room temperature, by heating or after exposure to ultraviolet radiation. They are known allergens and irritants that can cause problems both for consumers and through occupational exposure. This has been illustrated to us by two recent patients with differing presentations of nail acrylate allergy. The first was a 45-year-old nail technician who developed an eczematous reaction between her right middle and index fingers. These were the surfaces where she held her nail file. The second patient had eczema affecting the sides of her neck and fingertips and a nail dystrophy of most fingernails. She had worn acrylic nails for 1 year. Both patients developed allergic responses when patch tested to 2-hydroxyethylacrylate, methylmethacrylate, 2-hydroxyethylmethacrylate and ethylene glycol dimethacrylate. They were therefore advised to avoid contact with acrylic nails. This will present much greater difficulty for our nail technician because almost all protective gloves allow some penetration of the acrylate monomer and the use of gloves will affect her dexterity at work. Some commercially available 'hypoallergenic' ('acrylate-free') artificial nails have been shown to contain acrylate monomers, and sensitized individuals should be warned about this possibility.

Nail acrylate allergy causing dystrophic nails has previously been reported and in some cases has resulted in permanent nail loss. Other serious clinical presentations include onycholysis, onychomycosis, paronychia, subungual pain, fingertip paraesthesia and eyelid/face dermatitis. Hence it is important to warn patients of the persistent and sometimes permanent and disfiguring side-effects of this cosmetic treatment.

During the last 15 years in our department we have recorded eight cases of nail acrylate allergy. Seven of these patients were seen in the last 5 years. This may reflect greater awareness of this condition among the general public, general practitioners and dermatologists. Alternatively, the prevalence of this allergy may be increasing as 'Nail Bars' continue to proliferate on almost every High Street.

#### CD-14

##### **Contact dermatitis to dicyclohexyl carbodiimide**

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Dicyclohexyl carbodiimide (DCCI) is a coupling agent used in peptide synthesis to which chemists may become exposed and sensitized. We report a patient with industrial exposure leading to allergic contact dermatitis with this compound.

A 28-year-old chemist was involved in the synthesis of valaciclovir and reported symptoms of contact dermatitis. Initial patch testing to products supplied by the employer and to the standard series were negative.

Upon returning to work on the above process, a spillage resulted in another episode of contact dermatitis. This led to the identification of more potential allergens used in the industrial process, and patch testing was therefore repeated. A positive reaction to DCCI was found.

DCCI is a potent sensitizer, which was first reported to cause allergic contact dermatitis in 1975. Despite early predictions that this protein-coupling agent would be a common allergen given its widespread industrial use, reports of sensitization are rare.

We discuss the available literature pertaining to suitable patch testing vehicles for DCCI, whether protective measures are adequate, and the possibility that major histocompatibility complex variations may affect sensitization.

#### CD-15

##### **Heparin-associated eczema-like plaques: three cases**

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Acute eczema-like plaque formation caused by heparin has previously been documented and is thought to be due to a type IV hypersensitivity reaction. Low molecular weight heparins (LMWH) have been used for approximately 13 years and are now routinely used in protocols for the treatment of suspected myocardial infarction, unstable angina, deep vein thrombosis and pulmonary embolus. LMWH have also been implicated in eczema-like eruptions as well as the more familiar skin manifestations of urticaria, angio-oedema, skin necrosis and rarely alopecia.

Eczema-like eruptions may be under-reported as patients may be commenced concomitantly on other medications such

as aspirin, warfarin, beta-blockers etc., and the eruption may be mistaken for a drug eruption to these agents. We report three patients with an eczema-like reaction to enoxaparin.

Patient 1, a 46-year-old man, was given enoxaparin for unstable angina. His eruption occurred 3 days after commencing LMWH; it was initially adjacent to his injection sites but became generalized. It resolved on discontinuation of enoxaparin and treatment with clobetasol propionate.

Patient 2, a 64-year-old man, was given enoxaparin to treat a pulmonary embolus. He developed generalized eczema-like plaques within 10 days of the first injection.

Patient 3, a 70-year-old man, developed a widespread vesiculopapular eruption 5 days after commencing enoxaparin for a suspected deep vein thrombosis following a total knee replacement.

Skin biopsy in patient 1 showed subcorneal pustules with spongiosis and extensive dermal oedema and subepidermal bullae. There was a perivascular, mixed inflammatory cell infiltrate in the upper dermis. The findings were similar for patient 3. Patient 2 was not biopsied. Patch testing to enoxaparin was negative. Prick tests are awaited.

LMWH are used extensively in acute medicine. Eczema-like eruptions associated with LMWH, and particularly with enoxaparin, may be more frequent than previously recognized. Patch testing heparin of LMWH is difficult because the molecules are large. Other cases documented have not infrequently reported negative patch tests.

These cases emphasize the need for accurate diagnosis by the assisting dermatologist to prevent the potentially fatal consequences of erroneously discontinuing drugs such as aspirin in acute medical patients. We propose the name 'heparin-associated eczema-like plaques (HELP)' for this eruption.

#### Posters

#### CD-16

##### **Allergic contact dermatitis in 191 consecutively patch-tested children**

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Allergic contact dermatitis (ACD) in children has been reviewed in a number of studies. The reported prevalence and spectrum of allergens, including those in atopic individuals, highlight their importance in the investigation and management of children with eczema.

Our study aimed to assess the prevalence of ACD in a South Wales population of children, and to observe whether the rates and spectrum of allergens have changed. We also aimed to compare this spectrum with that in the adult population, and to identify allergens that are especially relevant to childhood ACD.

The patch test databases from 1993 to 2003 in two centres (total population 677 500) were searched for all children

16 years and under with a positive patch test to the European standard battery. Of 191 consecutive children undergoing patch testing, 79 (41%) had a positive result. Of these, 52% had current relevance, and 20% demonstrated multiple allergies. A previous review of ACD in children reported a similar prevalence rate (41%) but higher current relevance (71%) and polysensitization (21%) (Mortz CG, Andersen KE. Allergic contact dermatitis in children and adolescents. *Contact Dermatitis* 1999; **41**: 121–30).

The spectrum of positive allergens with current relevance is similar to that in the adult population, with allergy to nickel (12.7%), thiuram (8.9%), fragrance mix (8.9%) and cobalt (7.6%) yielding the highest positive results.

Prevalence of *p*-phenylenediamine (PPD) allergy showed a higher rate (6.3%) compared with most previous studies. Three patients with PPD allergy were trainee hairdressers with allergies to other work-related chemicals. Two patients had reacted to henna tattoos, an increasingly recognized presentation in children.

The sources of the allergens were often related to sport and hobbies, including contact with violins, racket handles and hockey gloves, or to treatments used more frequently in children (e.g. benzoyl peroxide in acne gel).

This study updates information on ACD in children and is the first of its kind to be carried out in a Welsh population. It highlights areas of vigilance when considering specific sources of these clinically relevant allergens.

### **CD-17** **Allergic contact dermatitis to gold in a hearing aid mould**

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A 13-year-old girl with profound sensorineural deafness presented with a 3-year history of an ill-defined, itchy,

erythematous, weeping and scaling rash in her right concha, extending over the tragus and preauricular skin. She wore a hearing aid in her right ear. Her audiologists, suspecting an allergy to her silicon hearing aid mould, had substituted this with a plastic mould (Starkey<sup>TM</sup>) and then a gold-plated mould, without effect. She had worn 9-carat gold earrings since she had had ear piercings at the ages of 7 and 12 years. She gave a history of finger eczema on wearing 9-carat gold rings and wrist eczema after wearing a metal-backed wrist-watch. There was no history of dental gold.

Patch testing to 0.5% gold sodium thiosulphate in petroleum gave a + reaction at days 2 and 4, which was repeatable, and a + reaction at days 2 and 4 to nickel and cobalt. The gold hearing aid mould was tested with dimethylglyoxine for the presence of nickel, and was negative. Although patch testing was negative to the plastics series, glue series and an Arlington<sup>TM</sup> plastic hearing aid mould, she developed a positive patch test reaction to the Starkey<sup>TM</sup> mould.

She was therefore diagnosed as having an allergic contact dermatitis (ACD) to the gold-plated and Starkey<sup>TM</sup> moulds, and discontinued their use. Two months following this, the eczema had completely resolved. Now, 18 months later, she wears a plastic (Arlington<sup>TM</sup>) mould without recurrence of the eczema.

Gold is an inert metal with low solubility, and to be a hapten it has to be ionized. Due to its nonreactive nature, gold plating is applied to hearing aid moulds when an ACD to the mould is suspected. It has been demonstrated, however, that artificial sweat is capable of dissolving small amounts of gold from gold alloys, and these complex ions in solution are thought to be able to induce ACD (Flint GN. A metallurgic approach to metal contact dermatitis. *Contact Dermatitis* 1998; **39**: 213–21).

There is a female preponderance for ACD to gold, and at least eight cases of this have occurred following ear piercing: this may have been the precipitant in our patient. This is the first reported case of an allergy to gold in a hearing aid mould.