
CASE REPORT

Severe anaphylactic reaction to chlorhexidine during total hip arthroplasty surgery. A case report

Thea Sijbesma ¹, Heike Röckmann ², Walter van der Weegen ¹

¹ Department of Orthopaedic Surgery, St. Anna Hospital, Geldrop - The Netherlands

² Department of Dermatology, University Medical Centre, Utrecht - The Netherlands

ABSTRACT: *Two consecutive hip surgery procedures in the same patient were aborted following a severe anaphylactic reaction of the patient. After the second procedure, the patient was diagnosed to be allergic to chlorhexidine, a component of the gel used to insert a urinary catheter. Chlorhexidine allergy is rare, and the delayed presentation may make it easy to overlook. In hip arthroplasty surgery, this may result in an abandoned procedure and the need for re-operation.*

KEY WORDS: *Chlorhexidine, Anaphylactic shock, Hip arthroplasty*

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INTRODUCTION

Anaphylactic reactions during surgery and anaesthesia are well described. Antibiotics, latex and muscle relaxants are the most common causes (1). There are several case reports of allergic responses to aprotinin or diamorphine (2, 3). There are numerous reports of serious allergic reactions from chlorhexidine, usually due to its application to wounds or mucous membranes (4-7). The majority of these reports originate from urological surgery (8-15). Chlorhexidine is an antiseptic which has been widely used in solutions, creams, gels and wound dressings since 1954 (16). Although anaphylaxis due to chlorhexidine allergy has been reported, mainly following urological procedures, it is generally not considered a risk during total joint replacement. Due to the delayed reaction (time interval of 15-30 minutes), the consequences during orthopedic surgery may be more severe, resulting in abandoned surgery. The presentation of chlorhexidine in a covert form may result in the assumption that other potential allergens are responsible. Skin tests with chlorhexidine have a high sensitivity and specificity (17). Chlorhexidine allergy appears to be associated with a severe type of allergic reaction (6, 9, 18).

CASE REPORT

A 51 year old male was referred with hip osteoarthritis secondary to congenital hip dysplasia. He had undergone two previous uneventful shoulder surgery procedures in our hospital.

Initially the patient was treated with an intra-articular injection of steroid and local anaesthetic, resulting in temporary pain relief. When his symptoms returned a decision was made to insert a total hip arthroplasty. Under general anaesthesia, a urinary catheter was inserted followed by operation site preparation with an iodine-based agent and draping. A posterolateral approach with the patient in the lateral decubitus position was employed. Approximately 20 minutes into the procedure, just after dislocation of the hip joint, the patient's oxygen saturation dropped to 80%, his blood pressure dropped to 80/50 mm Hg and his heart rate increased to 140. Even with 100% oxygen his saturation remained low at 80%. Surgery was abandoned, the joint was relocated and the wound was closed, allowing us to position the patient supine, at which point he recovered and was extubated. A cardiologist and respiratory physician excluded cardiovascular dysfunction or pulmo-

nary embolism. In the recovery room the patient was free of symptoms, and oxygen saturation recovered to 98%, chest auscultation was negative, and a chest radiograph was clear. A later review by the respiratory physician revealed normal pulmonary function. The cardiopulmonary collapse was thought to have been due to a vasovagal reaction to an unknown stimulus.

After healing of the wound, the patient agreed to a second procedure. On this occasion spinal anaesthesia was used. A urinary catheter was inserted and the patient was prepared and draped as before. A posterolateral approach was used, the capsule was opened and the hip dislocated. At this moment, the patient went into severe shock. Oxygen saturation dropped to 85%, blood pressure dropped to 80/50 mm Hg and heart rate increased to 145. Once again, surgery was abandoned, and on this occasion nausea and generalised urticaria were noted. The patient was intubated and recovered quickly after treatment with 1mg epinephrine, 2 mg clemastine and 100 mg prednisolone.

The urticaria during the second procedure suggested a diagnosis of an allergic reaction. Cefazolin appeared to be the only medication common to both procedures. The patient was referred for allergy testing.

Intracutaneous skin tests and a high-dose intramuscular challenge with Cefazolin were negative, as were a latex skin-prick test and latex specific IgE. Skin tests for iodine allergy were negative. The skin-prick test for chlorhexidine 0.5% showed a strong (3+) positive reaction (in contrast to five controls) confirming the specificity of this skin test.

During both surgical procedures, chlorhexidine had been an additive in the gel used to insert the urinary catheter (Cathejell-S, Montavit GmbH, Absam, Austria). The patient was referred back to us with a diagnosis of hypersensitivity to chlorhexidine. A total hip arthroplasty was finally implanted uneventfully, during which all standard drugs and substances (i.e. Cefazolin, Paracetamol, iodine) were used, except chlorhexidine.

DISCUSSION

Anaphylactic reactions to chlorhexidine are rare, and are principally confined to the anaesthetic and urology literature, generally occurring in the recovery room after completion of surgery (10-15). A urinary catheter is fre-

quently inserted prior to hip arthroplasty. A delayed allergic response to chlorhexidine (30 minutes) can result in an anaphylactic reaction, abandoned surgery, and the need for re-operation with an increased risk of complications.

Fat embolism was considered at the time of the first operation in the case described. This complication generally results from increased intramedullary pressure generated during insertion of an intramedullary implant (19, 20). In our case, this stage had not yet been reached, and post-operative pulmonary evaluation was normal. Nausea and generalised urticaria at the time of the second procedure made allergy the most likely cause. Chlorhexidine was subsequently incriminated.

Responses to chlorhexidine may vary from contact dermatitis, photo-sensitivity, 'fixed drug eruption', generalised urticaria to anaphylactic shock (5-7, 9, 18, 21, 22). Recently, chlorhexidine-allergy has been more frequently reported, particularly during anaesthesia (6, 10, 18). A warning regarding the use of chlorhexidine on mucous membranes was issued in Japan in 1989 (6). In 1998 the US Food and Drug Administration issued a Public Health Notification informing health care professionals about the potential for serious hypersensitivity reactions to chlorhexidine-impregnated medical devices (23). The risk of an allergic response increases when chlorhexidine is in contact with damaged skin or mucous membranes (18). However, even a low concentration of 0.05% can induce urticaria, oedema or an anaphylactic response when applied to the intact skin (22). Although chlorhexidine is no longer in use to disinfect urinary catheters, it is used worldwide as a component of lubricants for inserting urinary catheters and other medical devices.

In orthopaedic surgery, there is a trend to substitute chlorhexidine for iodine as a disinfectant for skin preparation, since reports increasingly favour chlorhexidine over iodine (24, 25). Chlorhexidine allergy may therefore occur more often, due to increased exposure and subsequent sensitization (10). In our case, the combination of mucous membrane exposure and microtrauma associated with inserting the catheter may have led to the severe anaphylactic reaction (9).

The delayed presentation, the fact that chlorhexidine is not a drug, and the fact that its presentation in a covert form makes it easy to overlook can make diagnosis difficult. In hip surgery, this may result in abandoned surgery and the need for re-operation.

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Address for correspondence:
Walter van der Weegen
Orthopedic Surgery Department
St. Anna Hospital
P.O. Box 90
5660 AB Geldrop, The Netherlands
w.vander.weegen@st-anna.nl

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