

Case Report

Diathermy smoke induced asthmatic attack during transurethral resection of prostate

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ABSTRACT

The use of diathermy and other electrosurgical devices have become an indispensable and integral part of modern surgical practice. This revolutionary benefit to surgery have been associated with the release of toxic agents that represents a potential health risk. A 79 year old who had an asthmatic attack during transurethral resection of prostate (TURP) on account of benign prostate enlargement. He was a known asthmatic, incidence of attacks had become infrequent over the years, and the last asthmatic attack was over 10 years ago. Triggers for attacks were strong smell, smoke and dusty environment. He had no other systemic disease of note. The procedure was done under subarachnoid block. Thirty minutes into the procedure, he was noticed to have difficulty in breathing and coughing, there was tachycardia and elevated blood pressure. The patient oxygen saturation was between 88-92% on room air, chest auscultation revealed a wide spread rhonchi. Oxygen via a non-rebreather face mask with reservoir bag at 10L/min was commenced and intravenous hydrocortisone 200mg was given. Forty minutes into the procedure, patient's condition did not improve. Procedure was discontinued and patient moved to the ward, patient was nebulized, intravenous aminophylline 250 mg given slowly, with repeated nebulization and continued oxygenation, patient condition improved. An immediate postoperative serum electrolyte, urea and creatinine done showed normal values to rule out TURP syndrome.

Keywords: Diathermy, Asthma, Transurethral resection of prostate

INTRODUCTION

The use of diathermy in modern surgery was first introduced by Czerny in 1910 when he described electro dissection or cutting by means of an electric current.¹

Surgical diathermy is an invaluable asset in modern surgical practice, its application in surgical practice is rapidly expanding though not without possible hazards to the operating room users. Studies have established the presence of toxic particulate in diathermy smoke and potentially harmful effects of exposure to these airborne contaminants.²⁻⁴

CASE REPORT

A 79 year old man who presented with bladder outlet obstruction. The patient was evaluated and a diagnosis of benign prostate enlargement was made, he was subsequently billed for a transurethral resection of prostate (TURP). He was a known asthmatic, incidence of attacks had become infrequent over the years, and the last asthmatic attack was over 10 years ago. Triggers for attacks were strong smell, smoke and dusty environment. He had no other systemic disease of note. The procedure was done under subarachnoid block. Thirty minutes into the procedure, he was noticed to have difficulty in

breathing and coughing, there was tachycardia and elevated blood pressure. The patient oxygen saturation was between 88-92% on room air, chest auscultation revealed a wide spread rhonchus. Oxygen via a non-rebreather face mask with reservoir bag at 10 l/min was commenced and intravenous hydrocortisone 200 mg was given. Forty minutes into the procedure, patient's condition did not improve. Procedure was discontinued and patient moved to the ward, patient was nebulized, intravenous aminophylline 250 mg given slowly, with repeated nebulization and continued oxygenation, patient condition improved. An immediate postoperative serum electrolyte, urea and creatinine done showed normal values to rule out TURP syndrome. The radiograph below is chest x-ray of the patient which was a normal study.

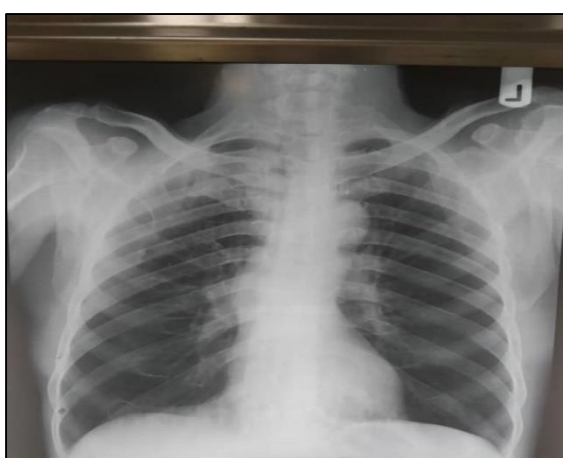


Figure 1: Chest radiograph.

DISCUSSION

Over the last three decades, diathermy use had become an integral component of modern surgical procedures. Diathermy derived from the Greek “dia” for passing through and “therma” meaning heat. It is defined as the cutting and coagulation of body tissue with a high frequency current.

Despite the revolutionary benefit of diathermy in modern surgical practices, it can constitute a major health hazard to both the healthcare providers and the patient. Diathermy emissions have been analyzed and found to contain invisible toxic particulate and the presence of these airborne particles is made more obvious by the smell associated with them, diathermy smoke has shown to contain asthma causing agents by sensitization or aggravating existing lung diseases by exposure to these irritants contained in diathermy smoke.^{5,6}

The index patient was a known asthmatic usually triggered by pungent smell or smoke and relieved by eliminating the offending agent. The patient was moved to the recovery room to preventing continuous exposure

to the offending agent in this case the diathermy smoke in the operation room.

A study done by King-Man and colleagues to assess the potential risk associated with diathermy smoke. They recommended the three-Step process for handling the potential hazard, these are: Minimization of the production of surgical smoke, evacuation of the smoke and the use of respiratory protective equipment (RPE).⁷ A similar study done by Pillinger and coworkers revealed that simply holding a suction device close to the diathermy probe have shown to reduce significantly the amount of smoke theatre users are exposed to.⁸

In another study to evaluate the views of theatre users on the perceived hazards from surgical smoke, any avoidance measures taken and any adverse effects experienced. The response amongst theatre users revealed uncertainty around the adverse effect and as such calls for extra-precautionary measure, some of the respondents advocates for the use of new technologies such as Harmonic scalpel and ligatures that reduces the production of smoke. On the other hand, smoke extractors from the theatre have also been advocated. However, this technology is either too expensive or unavailable.^{9,10}

CONCLUSION

The potential of diathermy smoke to cause health challenge do exists, at present it is difficult to quantify the magnitude of the health risk associated with diathermy use in modern surgical practice. The awareness of the health hazards and the availability of technology to evacuate or minimize the impact of diathermy smoke to the operating room users are being advocated.

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Ethical approval: Not required

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