

A Case of Fire Event in The Operation Room

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1. Abstract

Despite being uncommon, fire events in operation room can be drastic but also preventable. Oxidizer, fuel and heat construct the Triangle-of-fire. We are reporting a case of catching fire in a patient with liver hydatid cyst who underwent thoracotomy. Initiation of fire was related to the usage of alcohol-based solution as scolicidal agent and concomitant use of electrocautery. We encourage using non-alcoholic solution as scolicidal agent when feasible. Using cautery device with presence of flammable liquid/vapor in the operation field is strongly prohibited. Regular report and discussion of fire events in hospital morbidity programs seems to be beneficial as well.

2. Introduction

Hydatid cysts are caused by the parasite "Echinococcus Granulosus". Liver and lung are the mostly affected organs, respectively. To date, surgical removal is the mainstay of treatment and avoidance of contamination of thoracic and abdominal cavity during surgery is considered as a rule [1, 2]. For this purpose different scolicidal agents have been shown to be effective, including hypertonic saline, ethanol etc. Lateral-low thoracotomy through 7th -8th Intercostal space followed by phrenotomy, cyst cavity aspiration/suction and using scolicidal agent is performed with succession for liver hydatid disease located in posterior segments [3].

Using alcohol-based agents as scolicidal with concomitant apply of electrocautery or diathermy may result in ignition at 900 °c. Risk of ignition exists until the purity degree of alcohol becomes

less than 20% [4]. Although operation room fires are uncommon; they may have devastating consequences. They occur 100 times a year, which 10-20 cases of them are categorized as severe and 2 events resulting in death. Almost 70% of cases were related to an oxygen-enriched atmosphere. Of importance is to notice the significant risk with use of alcohol-based products as prep solutions [5, 6].

3. Case presentation

A 47-year-old woman with diagnosis of liver hydatid cyst in posterior segments of 7&8 brought to operating room. Thoracic cavity was not involved in pre-operative imaging studies. Patient intubated under general anesthesia, Position changed to left lateral decubitus and then skin prep was done using Povidone Iodine (Betadine 10%) in routine manner. Monopolar electrocautery device was connected and its adhesive pad fixed on right flank.

Thoracotomy through 7th Intercostal space was done, liver cyst palpated and diaphragm incised. A large 10 cm cyst was aspirated and suctioned with caution. The cyst was filled with ethanol 90% solution as a scolicidal agent. Meanwhile electrocautery was used for achieving hemostasis. Suddenly fire flames burned out of thorax. Fortunately, the fire extinguished in a few seconds by coverage with drapes and disconnecting electrocautery device. The area irrigated with cool saline and checked for probable damages. An area of 30 cm² grade 1&2 burn discovered and treated with topical ointments. The patient had an uneventful recovery and experienced no complication in follow-up sessions.

4. Discussion and Conclusion

The fire triangle describes heat, fuel and oxidizer as necessary elements for fire initiation. Electrosurgical unit is often responsible for heat production, although laser beams and sometimes fiber-optic light source are potent heat producers. Fuels are abundant in operation room such as prep solutions, alcohol-based sterilizer etc. Even if a 20% alcohol solution is used, temperature of 800-900 °c caused by hot wire cautery or diathermy can begin the fire.

We suggest using non-alcoholic alternative scolicidals like hypertonic saline in management of hydatid cyst when feasible. If using alcohol solution is inevitable, consider less-pure solutions to reduce the chance of ignition. Usage of electrocautery device of alcohol-based liquid/vapor is prohibited as a cautious measure. It seems logical to present fire event cases in morbidity conferences held in hospital for preventive measures as we did in our experience.

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