

Automatic Top Loader Washing Machine Related Injury. A Report of Four Cases with Serious Injury

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Summary

We are reporting four cases of serious washing machine related injury that presented within a period of 5 months. All patients were young children with the mean age of 9 year-old and three had their dominant hand injured. The washing machines involved were the automatic top loader type and all injuries occurred during the spinning phase. Serious automatic washing machine injury is not uncommon in Malaysia. We feel that there is a need to improve the safety features especially during the spinning phase. The operating instructions and safety precautions on the washing machine should be displayed in different languages that can be understood well. Parents should also be aware of the potential risks of this seemingly benign household appliance.

Key Words: Washing Machine Injury

Introduction

Washing machine injury is not uncommon. Consumer Product Safety Commission's National Electronic Injury Surveillance System, USA estimated that over 11,000 children suffer washing machine related injury each year in USA¹. Most of the injuries were minor, although serious injuries like fractures or dislocations have also been reported^{1,2,3,4}. We are reporting 4 cases of serious washing machine related injury that presented to our hospital over the short period of 5 months.

Case 1

WYY, a 9-year-old right hand dominant Chinese girl, presented with neglected dislocation of the right elbow. While trying to remove some clothes from the tub of an automatic top loader washing machine (*Sharp ES-C36M*) during the spinning phase, her right hand and forearm were caught by the clothes. She developed severe pain and deformity over the right elbow. She was initially treated by a traditional healer for 6 weeks before seeking medical advice from the hospital. On

presentation, the right elbow was anteriorly dislocated (Figure 1a) with a 2 cm x 2 cm ulcer over the posterior medial aspect exposing the medial humeral condyle. There was no distal neurovascular deficit. A transpositional flap was performed to cover the articular surface. The dislocation was gradually distracted with an Ilizarov external fixator and subsequently reduced by open reduction.

Case 2

LAG is an 8-year-old right handed Indian boy who had his right hand caught in an automatic top loader washing machine (*Singer WT575*). He was trying to remove his favorite pants from the tub during the spinning stage. He managed to lift the lid and put his hand into the washing machine through a small opening without activating the automatic stop system. The boy sustained closed fractures of the distal right radius and ulna (Figure 1b) with no neurovascular complication. He was treated with above elbow plaster cast and recovered well.

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Case 3

MZZ, a 14-year-old right hand dominant Malay boy, had his left hand trapped inside the automatic top loader washing machine (*Samsung*) while trying to remove his clothes from the tub. He opened the lid during the spinning phase and did not wait for the machine to stop completely. He sustained near total amputation of the left index finger and close fracture of the left second metacarpal (Figure 1c). The index finger stump was refashioned and the metacarpal fracture was treated with plaster slab. The injuries recovered well.

Case 4

DCR is a 6-year-old right handed girl who presented with near total amputation of her right ring finger at the level of the distal interphalangeal joint. She accidentally put her right hand into the tub of an automatic top loader washing machine (*Singer WT585*) and the right ring finger was entangled with an apron string. The stop system had been activated but the machine was still spinning at that moment. Attempt to replant the finger was unsuccessful and eventually the finger was amputated. (Figure 1d)



Fig 1a: The radiograph showed the neglected dislocation of the right elbow joint

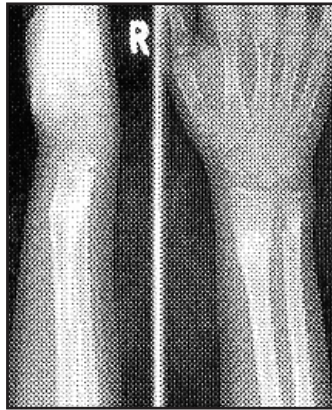


Fig 1b: The radiograph showed united fracture distal end right radius and ulna



Fig 1c: The radiograph showed the amputation of the left index finger with the spiral fracture of the left 2nd metacarpal

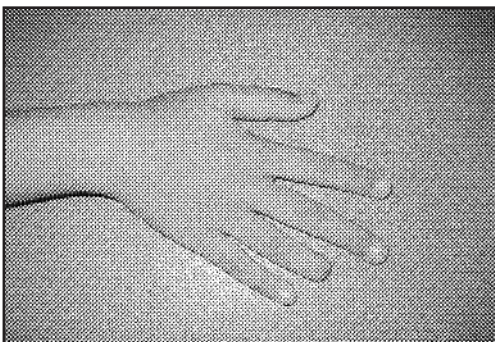


Fig 1d: The radiograph showed the amputation of the right ring finger over the distal interphalangeal joint level

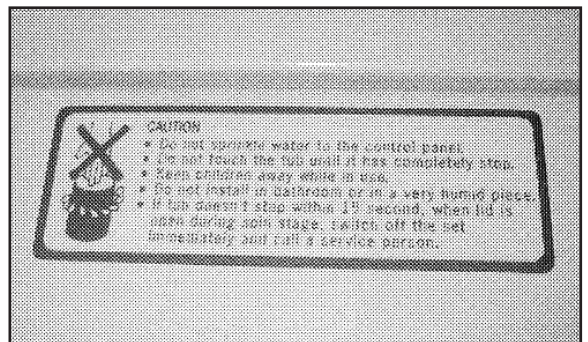


Fig 2: The safety precaution label on the washing machine, written only in English

Discussion

The washing machine is a common household appliance. There are generally six types of washing machines; (i)Automatic top loader, (ii)Automatic front loader, (iii)Twin tub, (iv)Wringer,(v)Top loading tumble washer, and (iv)Air injection washer.

There are numerous reports of wringer machine related injuries dating from 1938. These reports introduced the term of "wringer arm" for the upper extremity injury caused by this wringer washing machine⁵. The majority of injuries are minor i.e. injury to the skin, subcutaneous tissues and muscles. However, injury to the bone i.e. fractures or fracture dislocation was unusual². Weinshel et al. reported only two cases of fractures out of 99 wringer injuries over a period of 11 years³.

Nowadays, the number of the wringer washing machine injuries is declining due to the increasing use of automatic washing machines. Injuries due to automatic washing machine are increasing. Warner et al. reviewed 405 cases of automatic washing machine related injuries that occurred over a period of eight years using the data obtained from the United States Consumer Product Safety Commission (CPSC) and reported; i) the fracture rate of 15.3%, which is higher than the wringer washing machine, and ii) the dislocation, avulsion and amputation rates of 2.9%. The victims were predominantly male with the mean age of 4 years old⁴.

Our four unfortunate patients sustained three fractures and three fracture dislocations, resulting in permanent partial disability in three of them. All the injuries in our series were caused by automatic top loader washing machine. This type of washing machine is more popular in this part of the world because they are easier to maintain and more user friendly. The injuries occurred during the spinning phase, when a high speed rotation is used to dry the clothes. Factors

contributing to these injuries were faulty automatic stop system (Case 1), inefficiency of the system to detect minimal opening of the lid (Case 2) and residual rotation (Case 3 and 4).

Improvement in the safety features of the automatic top loader washing machine may prevent many of these injuries. The spinning should be automatically stopped whenever the lid is opened. The triggering system must be reliable and sensitive to detect even a small opening of the lid. A locking device might be helpful to make it less easy for the lid to be opened by children. In addition, an emergency breaking system can be added to reduce the extent of injury in the event of accidental entanglement. There is also a need for increased awareness of the potential dangers posed by the washing machine. Many users may like to remove the clothes from the washing machine before completion of the spinning phase if they feel that the clothes were already dry. Children may learn this practice through observation and underestimate the risk of such action. The potential danger should be stressed as part of the childhood household safety program. For example, a child should not be allowed to enter the area with an operating washing machine without supervision. The manufacturer should also display the operating instructions and safety precautions on the washing machine in different languages understood by their potential customers. In a multiracial country like Malaysia, explanation in English alone may not be adequate (Figure 2).

Conclusion

Serious washing machine injury related is not uncommon in Malaysia. The manufacturers should consider modifications of their product to make them safer while the end users should also take more precautions to avoid these preventable injuries.

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