

## Angle Grinder Related Burns in Older Persons

Dr Richard Atkinson\*, Dr John Vandervord\*, Dr Justine O'Hara\*^

\* Department of Plastics and Burns Surgery, Royal North Shore Hospital, NSW

^ Department of Plastics and Burns Surgery, Concord Repatriation Hospital, NSW

### Introduction:

Australia's ageing population is set to increase dramatically over the coming years with predictions that the proportion of people aged over 65 will increase from approximately 13% in 2007 up to 25% in 2056. These patients often present with significant co-morbidities that contribute to an increased burden on health care services particularly in the context of preventable injuries such as burns(1). Angle grinder related power tool injuries predominantly relate to penetrating hand and eye injuries for which older Australians are over-represented(2). Injuries most commonly occur when simple safety precautions or safety devices such as guards are not utilised(3) and have been implicated as one of the most common power tools to cause injury in Australia(2,3). Burns related to the use of angle grinders, although not common, represent a significant yet preventable cause for serious burns in a population group at risk of major complications during their initial presentation, subsequent acute treatment and ongoing rehabilitation. Also, decreased reaction times, poor vision and musculoskeletal conditions contribute to a greater risk of severe injury(1,2).

### Methods:

We undertook a retrospective review of the Statewide Burns Service database of all patients presenting with angle grinder related burns over the past 9 years in NSW. Our aim was to provide insight into the patterns of injuries, total body surface area (TBSA) involved and length of stay (LOS), in these patients as well as comparing these parameters between younger and older population groups.

### Case Report:

A 69yo retired gentleman presented with an 8% TBSA full thickness burn to the right axilla, chest and flank after sparks from an angle grinder had ignited the nylon clothes he was wearing. On admission he was noted to have new ST depression on his ECG with subsequent investigations confirming a silent non-ST elevation myocardial infarction. The patient underwent an angiogram and subsequent stenting of his occluded cardiac vessels and was commenced on anti-coagulation and antiplatelet agents. He underwent debridement and grafting of his burns for which he required post-operative blood transfusions. He had a background history of ischaemic heart disease, type 2 diabetes mellitus, laryngeal cancer, hypertension and hyperlipidemia. He had a 1 month long admission and required a period of rehabilitation to attain independence and mobility.



Figure 1: 8% full thickness burn: a)Pre-operative, b)first dressing change, c,d)day 12

### Results:

We were able to identify 74 patients with angle grinder related burns since 2004, of which, 55 were under the age of 60 (Mean age 34) and 19 were over the age of 60 (mean age 68). Of these, 42 were admitted to hospital (31 under 60 and 11 over 60). **Table 1** demonstrates the differences in mechanism of injury with their mean TBSA. Table 2 demonstrates the same for the admitted patients with a comparison of length of admission (LOS). The

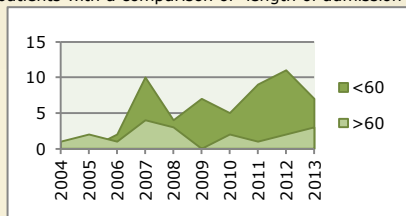


Figure 2: Year to year trend in presentation.

	<60 – no. & (Mean TBSA)	>60 – no. & (Mean TBSA)
Sparks igniting clothes	23 (2.3%)	9 (4.2%)
Sparks igniting accelerant	26 (6.5%)	7 (12.7%)
Sparks igniting environment	1 (1%)	2 (5.5%)
Contact burn	5 (0.5%)	1 (1.5%)

Table 1: Burn mechanism for all patients.

	<60 – no. & (Mean TBSA %)	< 60 Mean LOS	>60 – no. & (Mean TBSA %)	>60 Mean LOS
Sparks igniting clothes	13 (4%)	4.2	5 (6.6%)	18.4
Sparks igniting accelerant	15 (10%)	8.5	4 (20.5%)	30.8
Sparks igniting environment	1 (1%)	3	2 (5.5%)	15.5
Contact burn	1 (0.4%)	3	–	–

ignition of sparks predominantly involved the patients clothing or an accelerant either within the environment or within metal containers with residual liquid and flammable fumes, resulting in an explosion. Environmental burns related to grass fires ignited by sparks from the angle grinder with only 3 cases throughout the study period.

### Discussion and Recommendations:

This retrospective review has demonstrated that those over the age of 60 have a greater average TBSA and also have a longer length of stay when admitted to hospital. This pattern of more severe injury and increased length of stay is reflected in other literature examining power tool related injuries in older patients (2,3). Many aspects may influence this trend but it is likely a combination of greater severity of injury, an increased risk of complications and a greater impact in a vulnerable population group(2,3,4). This highlights the importance of education on the safe handling of power tools. More specifically, to the use of angle grinders, it is important that safety guards are used appropriately, flame resistant safety clothing and goggles are employed, environmental checks for potential flammable liquid or fumes is undertaken and the appropriate tool for the task is utilised (2,3,4).

### References:

- 1) Dinh, MM, Roncal, S, Byrne, M, et al. Growing trend in older patients with severe injuries: mortality and mechanisms of injury between 1991 and 2010 at an inner city major trauma centre. *Australian and New Zealand Journal of Surgery*. 2013; 83: 65-69.
- 2) Ashby, K, Ozanne-Smith, J, Fox, B. Investigating the over-representation of older persons in do-it-yourself home maintenance injury and barriers to prevention. *Injury Prevention*. 2007; 13: 328-333.
- 3) Ashby, K. Injuries associated with do-it-yourself maintenance activities. *Victorian Injury Surveillance System, Monash University Accident Research Centre* 1999; 41: 1-12.
- 4) Martin, L. DIY Injuries. A review of do-it-yourself injury surveillance, incidence and prevention in Australia and internationally. *Injury Control Council of Western Australia*. 2005. Accessed on 12/2/13 at: [www.iccwa.org.au/wp-content/uploads/2008/06/iccwa-diy-injury-report.pdf](http://www.iccwa.org.au/wp-content/uploads/2008/06/iccwa-diy-injury-report.pdf).