

## 1. Key Points

A 28-month retrospective review from February 2019 to April 2021 of PNIs at our trauma centre

The aetiology of PNI changed with an increase in the proportion of DSH cases from 1/3 to 2/3<sup>rd</sup>s of case (n=9 to n=25).

'Accidental Injuries' (AI) increased from 4% to 10% with GBH reducing from half to 1/5<sup>th</sup> of all cases and 'domestic violence' from 8% of cases to no cases (DV)

Data has shown a change in aetiology, psychiatric comorbidity and number of PNIs pre and post lockdown.

## 2. Introduction

Penetrating Neck Injuries (PNIs) are defined as a trauma which breaches the platysma (1). They are considered an uncommon but serious presentation requiring immediate treatment (2). Treatment can be classified into immediate, delayed and conservative (3).

Deliberate Self Harm (DSH) and other accidents are responsible for a significant proportion of PNIs in the United Kingdom (4). Our trauma centre, St George's University Hospital covers a wide geographical population of 3.5 million (5). It was speculated that lockdown would have a negative impact upon people's wellbeing (6). We sought to compare aetiology and differences in presentation of PNIs.

## 3. Methods



Figure 1. Methods used to identify PNIs

The UK national lockdown date of 23<sup>rd</sup> March 2020 was used to divide patients into 'pre-lockdown' or 'post-lockdown', with 14 months of data collected pre and post lockdown. We recorded data on 'hard signs' of PNIs, haemodynamic stability, use of fine nasal endoscopy (FNE), operative management, imaging and surgical specialities involved (2). NICE guidelines on Major Trauma and internal guidelines were used (3,7).

## 4. Results

Mechanism of Injury	Total number of patients (Feb 2019 to April 2021)	Pre-lockdown No. & % of patients	Post-lockdown No. & % of patients	% Change from pre to post lockdown (+/-)
Deliberate Self Injury (DSH)	34	9 (36%)	25 (67%)	+177.8%
Grievous Bodily Harm (GBH)	21	13 (52%)	8 (21%)	-38.5%
Accidental Injury (AI)	5	1 (4%)	4 (10%)	+300%
Domestic Violence (DV)	2	2 (8%)	0 (0%)	-100%
<b>Total</b>	<b>62</b>	<b>25</b>	<b>37</b>	<b>+48%</b>

Table 1. Mechanism of Injury of all patients

A total of 62 PNIs were identified from February 2019 to April 2021. In total, 83.9% of patients were male (n=52) whilst 16.1% were female (n=10). The most common implement was a knife (62.9% n=39) followed by bottle (8.1%, n=5) and gun (6.4%, n=4)).

Most PNIs were investigated with a CT scan (n=47), Chest X-ray (n=1) and many received both (17.7% n=11). A significant proportion of patients underwent a CTA/CT with contrast (67.7%, n=42) or FNE (29.0%, n=18).

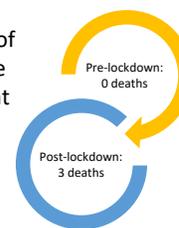


Figure 2. PNI deaths

The use of platelets and haemostatic agents such as tranexamic acid was frequent (46.8%, n=29) whilst major haemorrhage protocol was activated for some (n=16). In terms of definitive management, the most common was delayed exploration and closure under general anaesthetic (59.7%, n=37)).

Type of procedure	No. of patients with PNI who underwent procedure pre-lockdown	No. of patients with PNI who underwent procedure post-lockdown	Change +/- % of PNI patients who underwent procedure pre- to post-lockdown	Total % of PNI patients who underwent procedure
Exploration (under local or general anaesthetic)	17	25	+47.0	67.7
Closure of neck wound	9	15	+66.6	38.7
Panendoscopy	8	11	+37.5	30.6
Washout	3	7	+133.3	16.1
Foreign body removal	2	4	+100.0	9.7
Pharyngoscopy	1	3	+200.0	6.5
Laryngoscopy	1	2	+100.0	4.8

Table 2. The procedures undergone by patients



Figure 3. Change in psychiatric conditions

Zone of Injury	No. of patients Pre-lockdown	No. of patients post-lockdown	Total patients
I	3	8	11
II	13	14	27
III	1	2	3
I + II	3	4	7
II + III	4	5	9
I + II + III	1	1	2
Not Documented	0	3	3

Table 3. Zones of Injury

Hard sign	No. of patients before lockdown	No. of patients after lockdown	Total % patient experiencing hard sign
Airway compromise	6	4	16.1
Hypovolaemia	4	4	12.9
Arterial bleeding	5	2	11.3
Surgical emphysema	4	3	11.3
Hoarse voice	0	3	4.8
Expanding haematoma	1	0	1.6
Unable to swallow	0	1	1.6
Air escape	0	1	1.6
No hard signs	13	25	61.3

Table 4. Hard signs prevalence

## 5. Discussion

Our centre experienced an increase in number of surgical procedures. A prior 2009-2011 audit of PNIs in our trust revealed 48.0% attributed to DSH, this increased to 66.6% post-lockdown. (3).

The other major cause of PNI, GBH decreased to 21.6% of PNIs after the first lockdown (3). Increasing proportions of PNIs were investigated as outlined in NICE Guidelines (3,7). We compared this treatment with a previous 2009-2011 audit and found a noticeable increase in patients receiving a CTA or CT with contrast.

## 6. Conclusion

Post-lockdown, the characteristics of patients with PNIs has changed. We have experienced an increase in PNIs and a transformation to a cohort presenting mostly with DSH. This reflects the impact the COVID-19 pandemic on mental health.

We hope this single-centre audit of PNIs pre and post lockdown provides valuable insight and highlights the importance of multidisciplinary management of these complex patients.

## 7. References

- Sperry JL, Moore EE, Coimbra R, Croce M, Davis JW, Karmy-Jones R, et al. Western Trauma Association critical decisions in trauma: penetrating neck trauma. J Trauma Acute Care Surg. 2013 Dec;75(6):936-40.
- Nowicki JL, Stew B, Doi E. Penetrating neck injuries: A guide to evaluation and management. Ann R Coll Surg Engl. 2018;100(1):6-11.
- Szau RTK, Moore A, Ahmed T, Lee MSW, Tostevin P. Management of penetrating neck injuries at a London trauma centre. Eur Arch Oto-Rhino-Laryngology. 2013;270(7):2123-8.
- Burgess CA, Dale OT, Almeyda R, Corbridge RJ. An evidence based review of the assessment and management of penetrating neck trauma. Clin Otolaryngol. Off J ENT-UK; Off J Netherlands Soc Oto-Rhino-Laryngology Cerv-fac Surg. 2012 Feb;37(1):44-52.
- St George's NHS Foundation Trust. Media Enquiries - St George's University Hospitals NHS Foundation Trust [Internet]. [cited 2021 Jul 11]. Available from: <https://www.stgeorges.nhs.uk/news/media-enquiries/>
- Usher K, Durkin J, Bhullar N. The COVID-19 pandemic and mental health impacts. Int J Ment Health Nurs. 2020;29(3):315-8.
- Nice. Major trauma : assessment and initial management. 2018;(August):197-201. Available from: [www.nice.org.uk](http://www.nice.org.uk)