• Due to high energy mechanisms of injury and anatomic proximity, adult traumatic brachial plexus injury (AT-BPI) is often associated with fractures, spinal cord injuries and vascular injuries.

• Vascular injuries occur in 13-41% of AT-BPI cases. The spectrum of injury is broad, ranging from localized trauma to the subclavian vessels to the most severe injury of scapulothoracic dissociation (SD). This injury involves complete loss of scapulothoracic articulation with lateral scapula displacement and intact overlying skin.

• Outcomes of concomitant nerve and vascular injuries are rarely reported, generally not specific to AT-BPI, and often contradictory. The incidence of SD may be under-recognized.

• No significant differences (P=0.05) were found in age (mean 31 [range 16-69] years), sex (86% male, 14% female), or follow-up duration (mean 25.1 months for control, 25.6 months for the vascular injury group).

• The most common etiology of injury for both groups was motor vehicle accident. A fall from height more commonly resulted in AT-BPI without vascular injury (P=0.01).

• Among those with SD, vascular injury patients were more likely to have Zelle 3 injuries; upper trunk lesions and upper trunk + C7 lesions were both more common in the control group, whereas pan-plexus lesions were more common in the vascular injury group (Table 3).

• SD occurred in 15 cases (4.6%), including 10 controls (3.9%) and 5 vascular patients (7.4%). There was no significant difference in incidence of SD between groups (P=0.33).

• Upper trunk lesions and upper trunk + C7 lesions were both more common in the control group, whereas pan-plexus lesions were more common in the vascular injury group (Table 3).

• In the control cases, the most common procedure was nerve transfer (70%) as opposed to nerve grafting in the vascular injury group (39%). There was no significant difference in incidence of SD between groups (P=0.33).

• The vascular injury group was associated more with upper extremity (UE) fractures and a fall from height more commonly resulted in AT-BPI without vascular injury (P=0.05).

• No significant differences in pre-operative, post-operative, and mean DASH and VAS between control and vascular groups were found.

• No differences in patient-reported functionality between both study groups were found, with no differences in SD incidence between both study groups were found. The vascular group showed greater mean change in strength (1.4-pt increase in control group vs 0.9-pt increase in vascular group, P=0.004).

• The vascular injury group was associated more with upper extremity (UE) fractures and a greater extent of neural injury, as reflected in more pan-plexus injuries.

• No differences in SD incidence between both study groups were found. The vascular group exhibited more severe SD.

• Control patients underwent more nerve transfers while vascular patients received more nerve grafts, possibly due to limited options for nerve transfers. Nerve transfers typically demonstrate faster recovery and more specific regeneration than grafts.

• No differences in patient-reported functionally between both study groups were found; however, significant objective improvement in elbow flexion in control group was reported. Limitations included a small sample size, limited data on the vascular intervention prior to referral and on SD cases.

• The vascular injury group leads to worse functional outcome following reconstructive surgery of AT-BPI.

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Discussion and Conclusion

• The vascular injury group was associated more with upper extremity (UE) fractures and a greater extent of neural injury, as reflected in more pan-plexus injuries.

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Conclusion

Concomitant vascular injury leads to worse functional outcome following reconstructive surgery of AT-BPI.