



Predictive Factors for

CAROTID ARTERY PSEUDOANEURYSM RUPTURE

In patients with previous radiations for head and neck cancers:
A retrospective cohort of 32 cases

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OBJECTIVE

Predictive factors for pseudoaneurysmal bleeding

Carotid artery pseudoaneurysm rupture may occur in the head and neck cancer survivors who had received previous radiotherapy with **high morbidity and mortality**. The rate of bleeding among post-irradiated patients is reported from 4.5% to 21.1%. The survival rate at one year after index bleeding is 17% on average. The identification of patients with pseudoaneurysmal rupture is difficult and challenging. In this retrospective study, we reviewed the outcomes of cases with carotid artery pseudoaneurysm rupture and analyzed the **predictive factors** for pseudoaneurysmal bleeding versus other sources of bleeding with an aim to delineate the high risks group of patients for early and adequate investigations and treatments.

METHOD

Retrospective case cohort July 2016 to June 2020

INCLUSION

Patients who

- presented with oral, nasal or ear bleeding
- required investigations and treatments required
- history of head and neck cancer with history of radiation therapy

EXCLUSION

Patients who

- in past investigations or treatments not responded
- Carotid artery bleeding after open surgery

OUTCOME

Demographics Patient cancer types and treatments, medical comorbidities
Presentation Presenting symptoms, vital signs, blood tests
Investigation & Treatment Angiogram (DSA / CTA), Treatment details

RESULTS

There are total 32 patients with 41 bleeding episodes identified from 2016 July to 2020 June, including 22 male patients and 10 female patients. 17 patients had history of NPC while 5 patients had other pathology. The mean age at bleeding episode is 47.3 years old. There are 25 cases with cancer in remission, while 16 cases with active disease. Re-irradiation was performed for 8 cases. There are 10 cases suffering from second cancer apart from the primary head and neck cancer.

- 41 bleeding episodes for profuse nasal, oral or ear bleeding
- 10 ruptured carotid artery pseudoaneurysms identified
 - 7 ICA pseudoaneurysms
 - 6 patients received trapping after passing balloon occlusion test,
 - 1 patient received stenting
 - 2 patients were not treated
 - 3 ECA pseudoaneurysms all received trapping
 - 2 patients developed 30-day mortality (11.8%)

RESULTS FOR PREDICTIVE FACTORS

Baseline Hypertension RR 4.90

Patients with baseline hypertension was 4.90 times more likely to have pseudoaneurysmal rupture. (RR = 4.90, 95% CI 1.04 - 23.04, p=0.044)

Hypotensive on arrival RR 6.00

Patients with hypertension on presentation (SBP < 90 mmHg) are 6 times more likely to have pseudoaneurysmal rupture. (RR = 6.00, 95% CI 1.04 - 34.1%, p=0.044)

RESULTS

Hb Drop

The degree of hemoglobin drop was not significantly different between pseudoaneurysmal rupture and other sources of bleeding (2.1 g/dL vs 1.58 g/dL, p = 0.254)

CTA Predictive Value

CTA showed 100% positive predictive value and 50% negative predictive value in our series

Cardiac arrest

Cardiac arrest on presentation was likely to suggest pseudoaneurysmal rupture (p=0.004)

CONCLUSION

We have identified baseline hypertension and hypotension on arrival as predictive factors for carotid artery pseudoaneurysm rupture among patients who received previous radiation for head and neck cancers.

References

1. Kwon, J. et al. "The risk of pseudoaneurysm rupture after nasopharyngeal cancer re-irradiation and impact on quality of life." *Head Neck* 2019; 41(10): 1000-1005.
2. Frank, S. et al. "Head and neck cancer: A comprehensive review." *Head Neck* 2019; 41(10): 1000-1005.

METHOD

Retrospective case cohort

July 2016 to June 2020

INCLUSION



Patients who

- presented with oral, nasal or ear bleeding
- inpatient investigations and treatments required
- history of head and neck cancer with history of radiation therapy

EXCLUSION



Patients who

- In-patient investigations or treatments not warranted
- Carotid artery bleeding after open surgery

OUTCOME

Demographics

Patient cancer types and treatments, medical comorbidities

Presentations

Presenting symptoms, vital signs, blood tests,

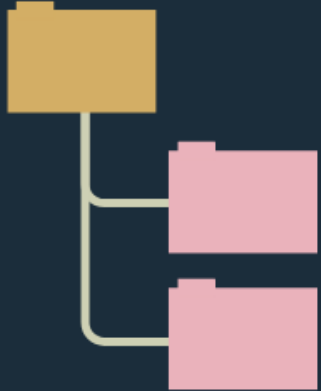
Investigation & Treatment

Angiograms (DSA / CTA), Treatment details

RESULTS



There are total **32 patients** with **41 bleeding episodes** identified from 2016 July to 2020 June, including 22 male patients and 10 female patients. 27 patients had history of NPC while 5 patients had other pathology. The mean age at bleeding episode is 47.3 years old. There are 25 cases with cancer in remission, while 16 cases with active disease. Reirradiation was performed for 8 cases. There are 10 cases suffering from second cancer apart from the primary head and neck cancer.



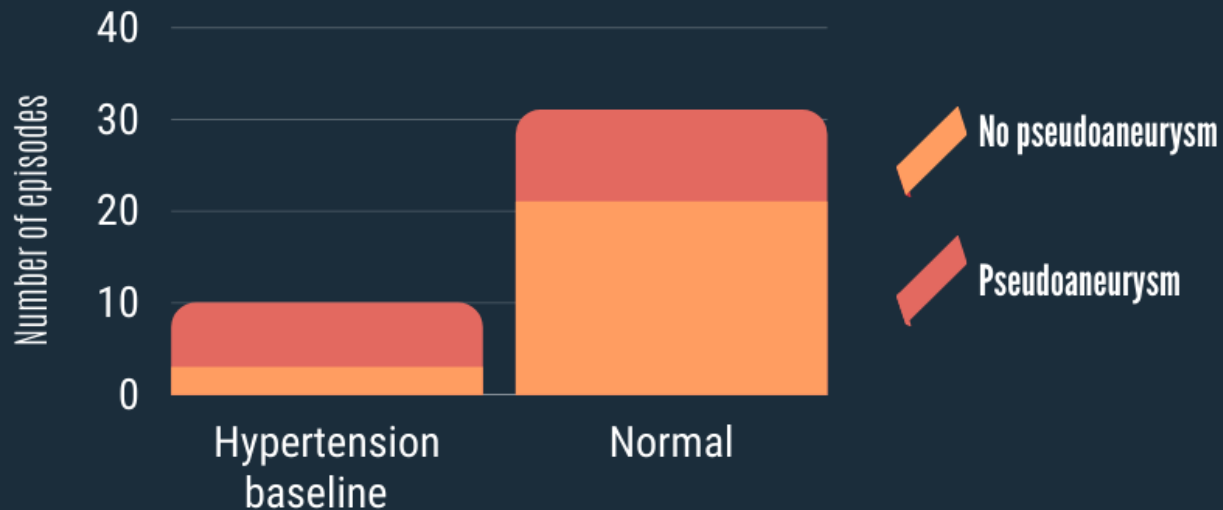
- 41 bleeding episodes for profuse nasal, oral or ear bleeding
- 17 ruptured carotid artery pseudoaneurysms identified
 - 11 ICA pseudoaneurysms
 - 8 patients received trapping after passing balloon occlusion test,
 - 1 patient received stenting
 - 2 patients were not treated
 - 6 ECA pseudoaneurysms all received trapping
 - 2 patients developed 30-day mortality (11.8%)

RESULTS FOR PREDICTIVE FACTORS

Baseline Hypertension

RR 4.90

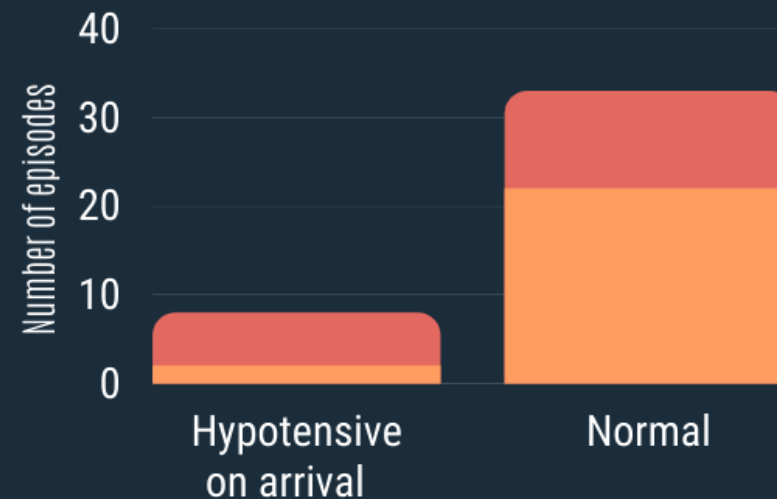
Patients with baseline hypertension was 4.90 times more likely to have pseudoaneurysmal rupture. (RR = 4.90, 95% CI 1.04 - 23.04, $p=0.044$)



Hypotensive on arrival

RR 6.00

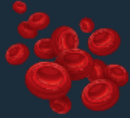
Patients with hypotension on presentation (SBP ≤ 90 mmHg) are 6 times more likely to have pseudoaneurysmal rupture. (RR = 6.00, 95% CI 1.04 - 34.75, $p=0.046$)



RESULTS

Hb Drop

The degree of hemoglobin drop was not significantly different between pseudoaneurysmal rupture and tumor bleeding (2.11 g/dL vs 1.58 g/dL, $p = 0.234$).



CTA Predictive Value

CTA showed **85%** positive predictive value and **50%** negative predictive value in our series



Cardiac arrest

Cardiac arrest on presentation was likely to suggest pseudoaneurysmal rupture ($p=0.064$).



CONCLUSION

We have identified **baseline hypertension** and **hypotension on arrival** as predictive factors for carotid artery pseudoaneurysm rupture among patients who received previous radiation for head and neck cancers.

References

1. Suárez, Carlos, et al. "Carotid blowout syndrome: modern trends in management." *Cancer management and research* 10 (2018): 5617.
2. Prasad, Karthik K., et al. "Carotid blowout syndrome: An oncological emergency less discussed." *South Asian journal of cancer* 6.2 (2017): 85.