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Venous thromboembolism in patients with head and neck cancer after surgery.

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Abstract

BACKGROUND: The purpose of this study was to report the incidence of venous thromboembolism (VTE) in patients with head and neck cancer after surgery.

METHODS: This was a single-institution, retrospective cohort: 134 patients underwent resection and simultaneous microvascular reconstruction. The primary endpoint was identification of confirmed or suspicious VTE within 30 days of surgery.

RESULTS: Two subjects (1.4%) with confirmed VTE (1 pulmonary embolism, 1 deep venous thrombosis) and 6 subjects (4.4%) with suspicious VTE (1 acute respiratory failure, 1 sudden cardiac arrest, and 4 cases of leg edema without imaging) were identified. The strongest predictors of possible VTE were prior VTE ($p = .004$; odds ratio [OR], 25.11; 95% confidence interval [CI], 1.13-556.40), red cell transfusion ($p = .009$; OR, 1.80; 95% CI, 1.16-2.80), high body mass index ($p = .015$, OR, 1.29, 95% CI, 1.05-1.58), and older age ($p = .046$; OR, 1.10; 95% CI, 1.00-1.19).

CONCLUSION: The incidence of VTE in patients with head and neck cancer after resection and microvascular reconstruction ranged from 1.4% to 5.8%.

頭頸部手術後の静脈血栓.

背景: 頭頸部癌術後の静脈血栓(VTE)の発生率を調べる。

方法: 単一施設後ろ向き研究: 切除術・同時血管再建術を行った 134 患者を対象。プライマリエンドポイントは術後 1 ヶ月以内の VTE 確定診断または疑い。

結果: 2 症例は VTE 確定診断(肺塞栓 1 例、DVT1 例)であり、6 症例は VTE 疑い(急性呼吸器障害 1 例、心停止 1 例、下肢浮腫 4 例)であった。VTE の最も重要な予測因子は VTE 既往($p=.004$; OR 25.11; 95%信頼区間 1.13-556.40)、赤血球輸血($p=.009$; OR 1.80; 95% CI 1.16-2.80)、BMI 高値($p=.015$; OR 1.29; 95% CI 1.05-1.58)、高齢($p=.046$; OR 1.10; 95% CI 1.00-1.19)であった。

結論: 対象患者での VTE の発生率は 1.4%~5.8%であった。

VTE は肺塞栓や DVT を含めて、致死的になり得る重要な疾患群である。担癌患者ではその発生率が上昇することが知られており、4 倍から 6 倍と言われている。さらに、周術期では血栓が起きやすくなるため、VTE のコントロールが重要となる。担癌患者での周術期の VTE のリスクは非担癌患者より 2 倍程度といわれている。また、VTE の症状としては、下肢の浮腫から肺塞栓まで様々であり、そのいくつかは致死的となる。最近の報告では、担癌患者の周術期の最も頻度の高い死亡原因は VTE によるものとされている。

また、遊離臓器の血管再建術付きの手術での VTE のリスクファクターとして、進行癌・高齢・術時間が挙げられている。しかし、実際に HNC での VTE のリスクファクター等の研究はほとんどされていないため、生存率を含めた解析を行った。

2007 年から 2009 年に Oregon Health and Science University で HNC を 4 時間以上の血管再建術付きの手術で加療された患者を対象とした。そして、(1)担癌患者(2)以前に癌治療を受けて今はない患者の 2 群に分けて解析した。(2)は主に、2 度目の再建手術である。プライマリエンドポイントは VTE 疑いまたは確定診断であり、下肢の浮腫等の VTE を疑う所見・肺塞栓・画像診断により判断された。

患者群では、喫煙・BMI で主に有意差があった。周術期の治療に関しては、術後アスピリン投与が(1)で多かった。また、(2)の群で離床までの期間が短かった。VTE 発症は(1)で 8 例、(2)で 2 例であった。Caprini risk score については、VTE 確定診断・疑い・なしの群間で有意差は無かった。

多変量解析では、年齢・BMI・RBC 輸血・VTE 既往で有意差を認めた。

TABLE 1. Patient characteristics.

Variable	Active cancer group	Prior cancer group	<i>p</i> value
Total patients, <i>N</i>	134	26	—
Total cases, <i>n</i>	139	32	
Age, y			.78
Mean	65.4	64.5	
SD	15.9	15.2	
Sex			.60
Male	82 (59%)	21 (66%)	
Female	57 (41%)	11 (34%)	
Smoking status			.005
Never	44 (32%)	5 (16%)	
Active	43 (31%)	5 (16%)	
Quit	52 (37%)	22 (68%)	
Body mass index			.07
Mean	25.6	23.6	
SD	5.3	4.9	
VTE: prior VTE history	7 (5%)	0	.42
Comorbidities			
DM	21 (15%)	0	.04
Atrial fibrillation	17 (12%)	2 (6%)	.51
COPD	22 (16%)	3 (9%)	.51
PVD	14 (10%)	3 (9%)	1.00
Histology			.88
Squamous cell carcinoma	106 (76%)	23 (72%)	
Basal cell carcinoma	6 (4%)	1 (3%)	
Melanoma	5 (4%)	1 (3%)	
Adenocarcinoma	5 (4%)	0	
Adenoid cystic carcinoma	3 (2%)	2 (6%)	
Other	13 (9%)	5 (16%)	
Medication use			
ASA	32 (23%)	9 (28%)	.70
Estrogen	1 (1%)	3 (9%)	.02
Prior therapy			
Chemotherapy	13 (9%)	9 (28%)	.10
Radiation therapy	51 (37%)	28 (88%)	<.001

Abbreviations: SD, standard deviation; VTE, venous thromboembolism; DM, diabetes mellitus; COPD, chronic obstructive pulmonary disease; PVD, peripheral vascular disease; ASA, aspirin.

TABLE 3. VTE outcomes.

Outcome	Active cancer group	Prior cancer group
Total cases, <i>n</i>	139	32
Confirmed		
PE	1	0
DVT	1	0
Suspicious		
Respiratory failure	1	0
Cardiac arrest	1	0
Leg edema	4	2
Possible total	8 (5.8%)	2 (6.3%)

Abbreviations: VTE, venous thromboembolism; PE, pulmonary embolism; DVT, deep venous thrombosis.

TABLE 2. Procedures and perioperative findings.

Outcome	Active cancer group	Prior cancer group	<i>p</i> value
Total cases, <i>n</i>	139	32	—
Operative time, h			.57
Mean	8.2	7.2	
SD	2.3	3.0	
Free-tissue donor site			.61
Radial forearm	60 (43%)	12 (38%)	
Anterolateral thigh	26 (19%)	5 (16%)	
Fibula osteocutaneous	15 (11%)	9 (28%)	
Rectus musculocutaneous	13 (9%)	2 (6%)	
Latissimus dorsi musculocutaneous	12 (9%)	1 (3%)	
Jejunum	6 (4%)	0	
Other	7 (6%)	3 (9%)	
Tourniquet time, min			.12
Mean	15.0	22.0	
SD	20.0	23.0	
Anticoagulation			
Intraoperative heparin	11 (8%)	2 (6%)	1.00
Postoperative heparin	24 (17%)	4 (13%)	.76
Postoperative aspirin	60 (43%)	6 (19%)	.02
Complications			.85
Pulmonary embolism	1 (0.72%)	0	
Respiratory failure	1 (0.72%)	0	
Cardiac arrest	1 (0.72%)	0	
Anoxic brain injury	1 (0.72%)	0	
Recipient site infection	7 (5%)	4 (13%)	
Other	4 (3%)	2 (6%)	
Ambulation time, d			.07
Mean	15.0	22.0	
SD	20.0	23.0	
Length of stay, d			.20
Mean	10.1	10.6	
SD	10.0	7.9	

Abbreviation: SD, standard deviation.

TABLE 4. Multivariate analysis for active cancer group

Variable	Odds ratio	95% CI	<i>p</i> value
Length of stay	0.89	0.75–1.04	.15
Age	1.10	1.00–1.19	.046
BMI	1.29	1.05–1.58	.015
Red cell transfusion	1.80	1.16–2.79	.009
VTE (prior)	25.11	1.13–556.39	.041

Abbreviations: CI, confidence interval; BMI, body mass index; VTE, venous thromboembolism.

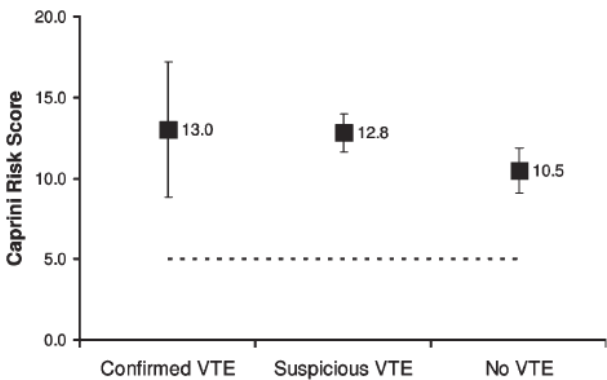


FIGURE 1. Comparison of Caprini risk assessment scores between patients with confirmed, suspicious, and no venous thromboembolism (VTE). There was no statistically significant difference between groups. Patients with a Caprini score ≥ 5 (represented by the dotted line) are considered to be at highest risk for deep venous thrombosis (DVT).



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Thrombosis Risk Factor Assessment

Patient's Name: _____ Age: ____ Sex: ____ Wgt: ____ lbs

Choose All That Apply

Each Risk Factor Represents 1 Point

- ☐ Age 41-60 years
- ☐ Minor surgery planned
- ☐ History of prior major surgery (< 1 month)
- ☐ Varicose veins
- ☐ History of inflammatory bowel disease
- ☐ Swollen legs (current)
- ☐ Obesity (BMI > 25)
- ☐ Acute myocardial infarction
- ☐ Congestive heart failure (< 1 month)
- ☐ Sepsis (< 1 month)
- ☐ Serious lung disease incl. pneumonia (< 1 month)
- ☐ Abnormal pulmonary function (COPD)
- ☐ Medical patient currently at bed rest
- ☐ Other risk factors _____

Each Risk Factor Represents 3 Points

- ☐ Age over 75 years
 - ☐ History of DVT/PE
 - ☐ **Family history of thrombosis***
 - ☐ Positive Factor V Leiden
 - ☐ Positive Prothrombin 20210A
 - ☐ Elevated serum homocysteine
 - ☐ Positive lupus anticoagulant
 - ☐ Elevated anticardiolipin antibodies
 - ☐ Heparin-induced thrombocytopenia (HIT)
 - ☐ Other congenital or acquired thrombophilia
- If yes:

Type _____

*most frequently missed risk factor

Each Risk Factor Represents 2 Points

- ☐ Age 60-74 years
- ☐ Arthroscopic surgery
- ☐ Malignancy (present or previous)
- ☐ Major surgery (> 45 minutes)
- ☐ Laparoscopic surgery (> 45 minutes)
- ☐ Patient confined to bed (> 72 hours)
- ☐ Immobilizing plaster cast (< 1 month)
- ☐ Central venous access

Each Risk Factor Represents 5 Points

- ☐ Elective major lower extremity arthroplasty
- ☐ Hip, pelvis or leg fracture (< 1 month)
- ☐ Stroke (< 1 month)
- ☐ Multiple trauma (< 1 month)
- ☐ Acute spinal cord injury (paralysis)(< 1 month)

For Women Only (Each Represents 1 Point)

- ☐ Oral contraceptives or hormone replacement therapy
- ☐ Pregnancy or postpartum (<1 month)
- ☐ History of unexplained stillborn infant, recurrent spontaneous abortion (≥ 3), premature birth with toxemia or growth-restricted infant

Total Risk Factor Score

Prophylaxis Regimen

Total Risk Factor Score	Incidence of DVT	Risk Level	Prophylaxis Regimen	Legend
0-1	<10%	Low Risk	No specific measures; early ambulation	ES - Elastic Stockings IPC - Intermittent Pneumatic Compression LDUH - Low Dose Unfractionated Heparin LMWH - Low Molecular Weight Heparin Fac Xa - Factor X Inhibitor
2	10-20%	Moderate Risk	ES or IPC or LDUH, or LMWH	
3-4	20-40%	High Risk	IPC or LDUH, or LMWH alone or in combination with ES or IPC	
5 or more	40-80% 1-5% mortality	Highest Risk	Pharmacological: LDUH, LMWH*, Warfarin*, or Fac Xa* alone or in combination with ES or IPC	

Prophylaxis Safety Considerations: Check box if answer is 'YES'

Anticoagulants: Factors Associated with Increased Bleeding
☐ Is patient experiencing any active bleeding?
☐ Does patient have (or has had history of) heparin-induced thrombocytopenia?
☐ Is patient's platelet count <100,000/mm ³ ?
☐ Is patient taking oral anticoagulants, platelet inhibitors (e.g. NSAIDS, Clopidigrel, Salicylates)?
☐ Is patient's creatinine clearance abnormal? If yes, please indicate value _____
If any of the above boxes are checked, the patient may not be a candidate for anticoagulant therapy and should consider alternative prophylactic measures.
Intermittent Pneumatic Compression (IPC)
☐ Does patient have severe peripheral arterial disease?
☐ Does patient have congestive heart failure?
☐ Does patient have an acute superficial/deep vein thrombosis?
If any of the above boxes are checked, then patient may not be a candidate for intermittent compression therapy and should consider alternative prophylactic measures.

Based on: Geerts WH et al: Prevention of Venous Thromboembolism. Chest 2001; 119:132S-175S; Nicolaides AN et al: 2001 International Consensus Statement: Prevention of Venous Thromboembolism, Guidelines According to Scientific Evidence; Caprini JA, Arcelus JI et al: State-of-the-Art Venous Thromboembolism Prophylaxis. Scope 2001; 8: 228-240; and Oger E: Incidence of Venous Thromboembolism: A Community-based Study in Western France. Thromb Haemost 2000; 657-660. Turpie AG, Bauer KA, Eriksson BI, et al: Fondaparinux vs. Enoxaparin for the Prevention of Venous Thromboembolism in Major Orthopedic Surgery: A Meta-analysis of 4 Randomized Double-Blind Studies. Arch Intern Med 2002; 162(16):1833-40. Ringley et al: Evaluation of pulmonary intermittent pneumatic compression boots in congestive heart failure. American Surgeon 2002; 68(3): 286-9. Morris et al: Effects of supine intermittent compression on arterial inflow to the lower limb. Archives of Surgery 2002; 137(11):1269-73. © 2001 Evanston Northwestern Healthcare; all rights reserved.

Examining Physician's Signature: _____ Date: _____