

Traitement chirurgical du SDTB (forme artérielle et neurologique) : Indications, techniques et résultats

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Indications chirurgicales

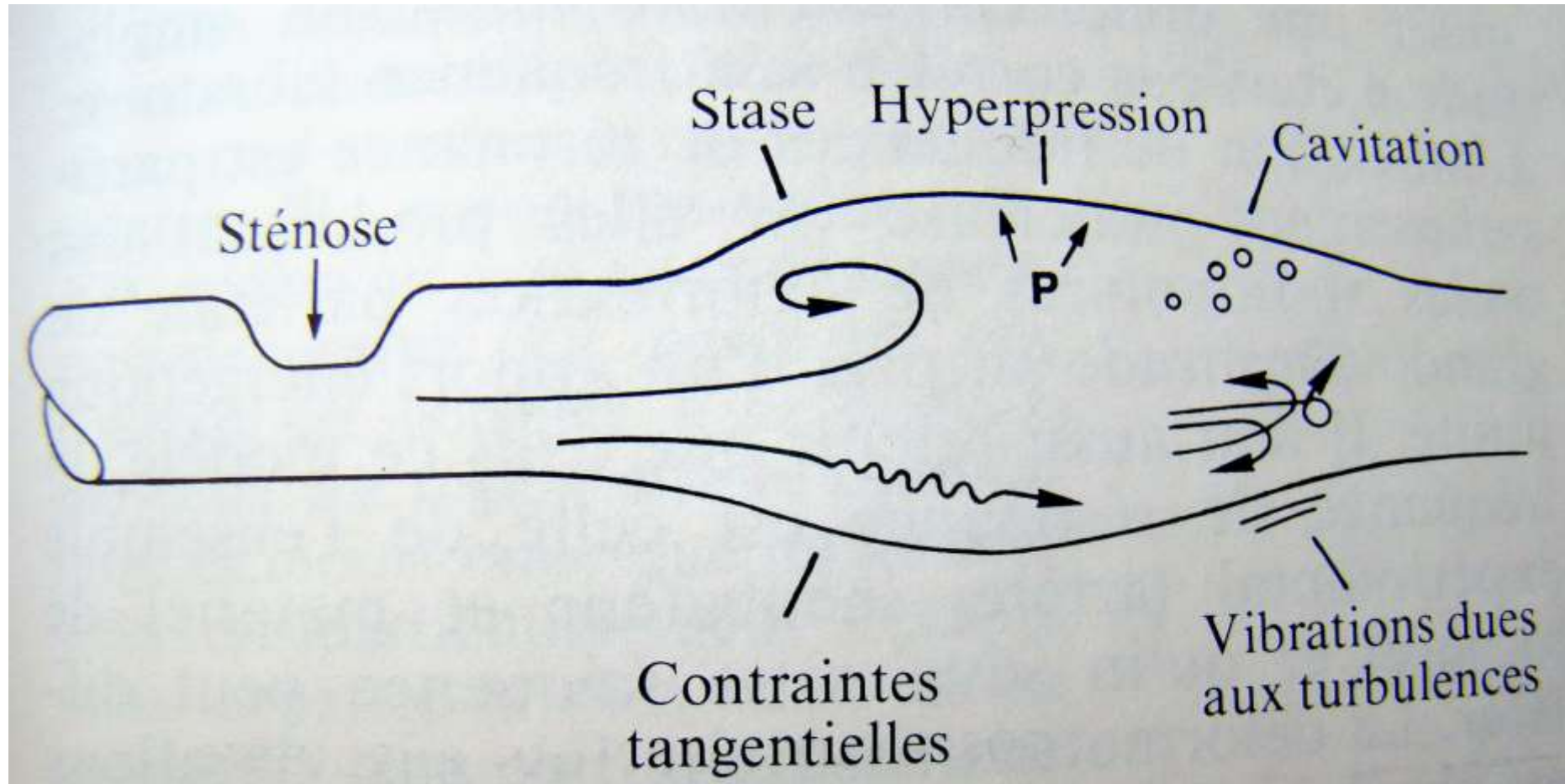
- Manifestations fonctionnelles : rééducation en 1^{er} lieu
- Formes artérielles compliquées, rares, graves, parfois urgentes : chirurgie de décompression + restauration artérielle
- Formes nerveuses compliquées, très rares : chirurgie de décompression (récupération limitée)
- Les échecs du traitement médical (artériel, neuro.)

Dystonie neuro-psychique à prendre en compte

Formes artérielles compliquées

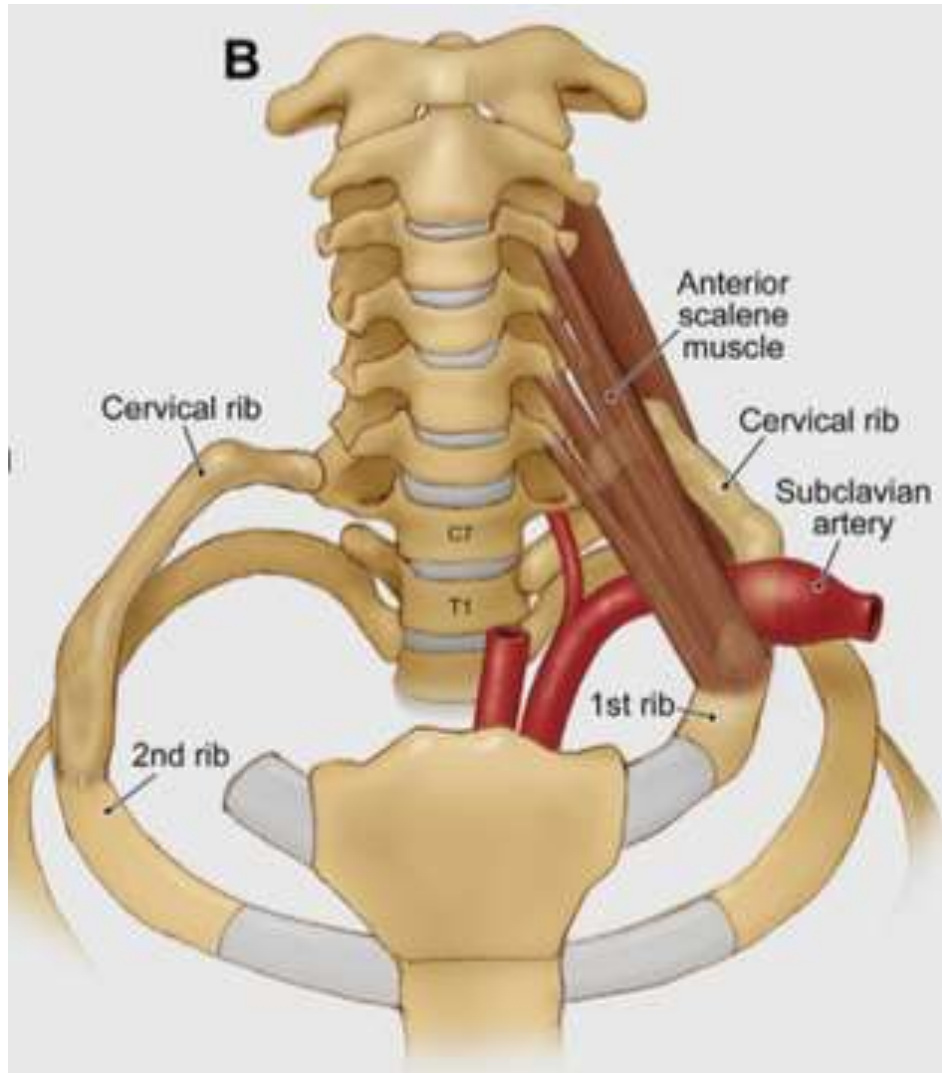
- Anévrysme de l'artère sous-clavière
- Embolies, thrombose extensive,...
- Anomalies osseuses très fréquentes dans ces cas (côtes cervicales, agénésie 1ère côte, ...)
- Chirurgie de décompression + restauration artérielle (a. sous-clavière et lit d'aval)

Physiopathologie



Côte cervicale bilatérale





Côte cervicale



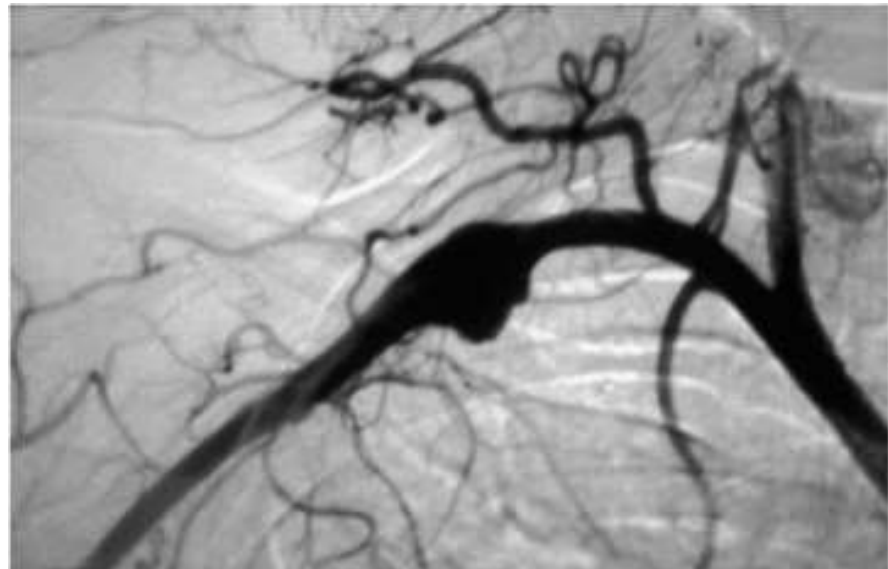
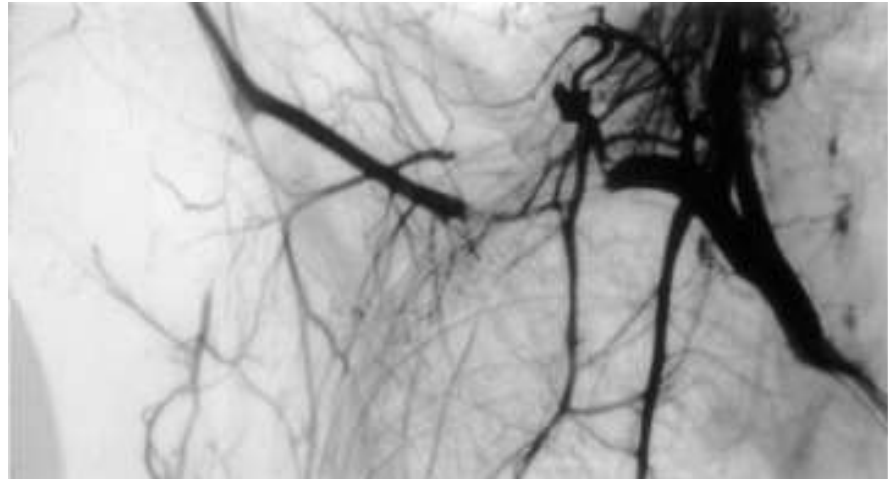
Côte cervicale avec
néoarthrose sur 1^{ère} côte

Apophysomégalie C7



Artériographie

- forme artérielle
- Position :
 - repos
 - abduction 90°
- Défilé jusqu' à la main



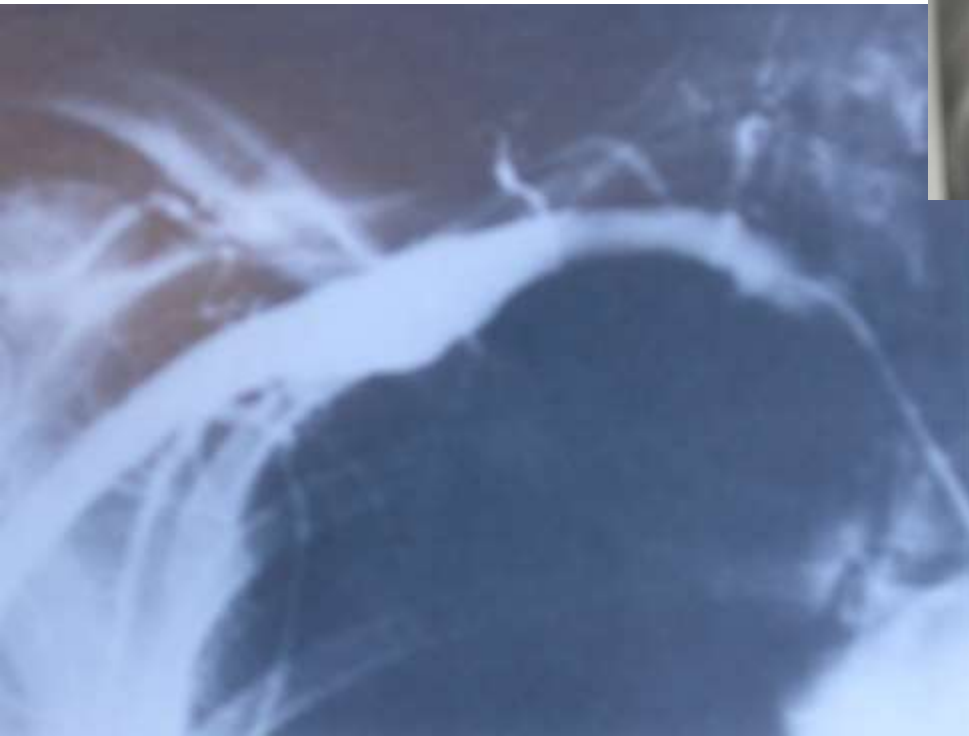
Artériographie dynamique



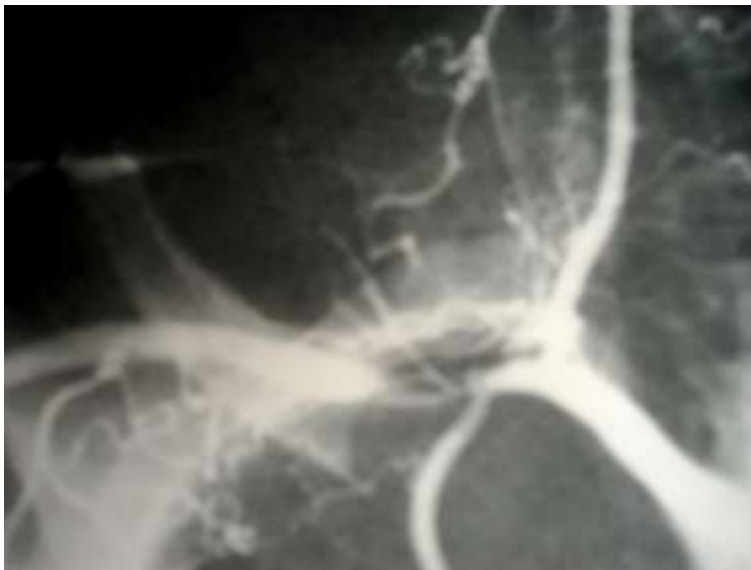
Artériographie dynamique



Artériographie



Artériographie



Artériographie



Artériographie



Artériographie



Artériographie



Artériographie



Chirurgie 1 : décompression

- Scalénectomie antérieure et moyenne
- Résection des éléments musculo-ligamentaires compressifs
- Résection des anomalies osseuses
- Résection de la 1ère côte

Chirurgie 2 : revascularisation

- Résection anastomose de l'artère sous-clavière
- Pontage veineux / prothétique de l'a. sous-clavière
- Endoanevrysmorrhaphie restauratrice
- Thrombolyse, thrombectomie du lit d'aval, pontages veineux...échecs fréquents
- Sympathectomie thoracique parfois associée

Formes neurologiques compliquées

- Très rarement, paralysie, amyotrophie de la main
- Chirurgie de décompression, neurolyse du plexus brachial
- Le plus souvent, peu de récupération

Echecs de la rééducation fonctionnelle

- Jamais de décision chirurgicale à la 1ère consultation
- Recherche d'une anomalie osseuse ++
- Meilleur pronostic des formes artérielles, chez les sportifs
- Formes neurologiques, les + fréquentes, les + atypiques : le plus souvent, paresthésies, douleurs intermittentes territoire C8-T1. Pas de signes neuro. objectifs
- Le caractère incertain du diagnostic des formes neurologiques du STTB : certains contestent son existence
- Evaluation psychologique pré-opératoire
- Information du malade sur les risques opératoires +++

TECHNIQUES

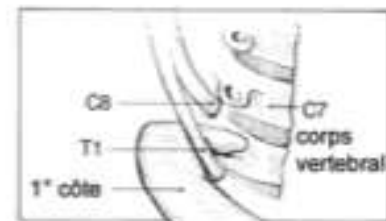
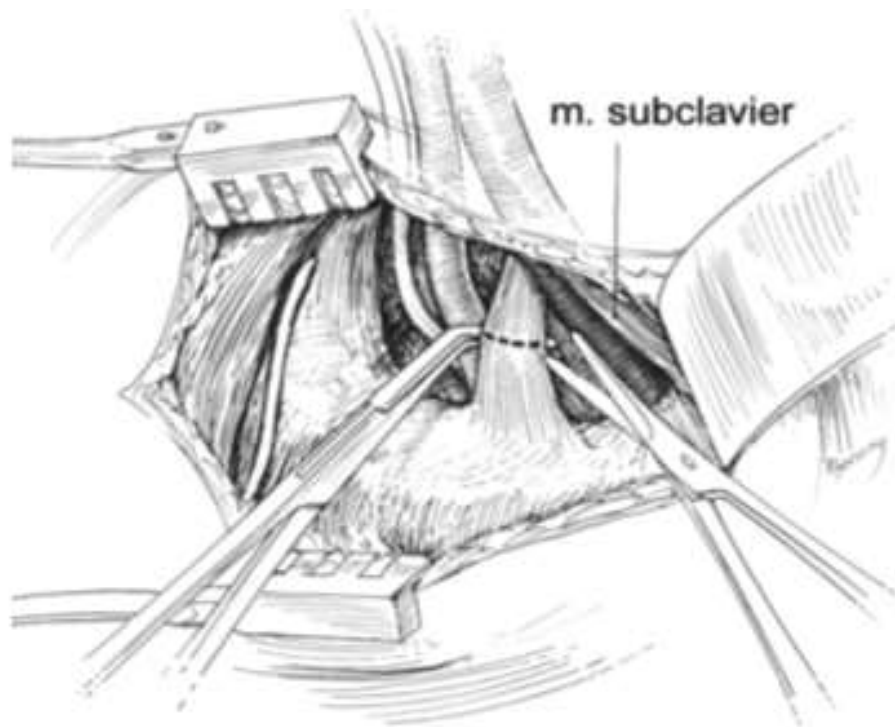
La chirurgie : résection de la 1ère côte

- Voie axillaire de Roos (partie antérieure) pour les formes veineuses ou artérielles
- Voie sus-claviculaire (partie postérieure) permet la neurolyse du plexus pour les formes artérielles ou neurologiques
- Voie sous-claviculaire (partie antérieure) pour les formes veineuses
- Voies sus et sous-claviculaire combinées

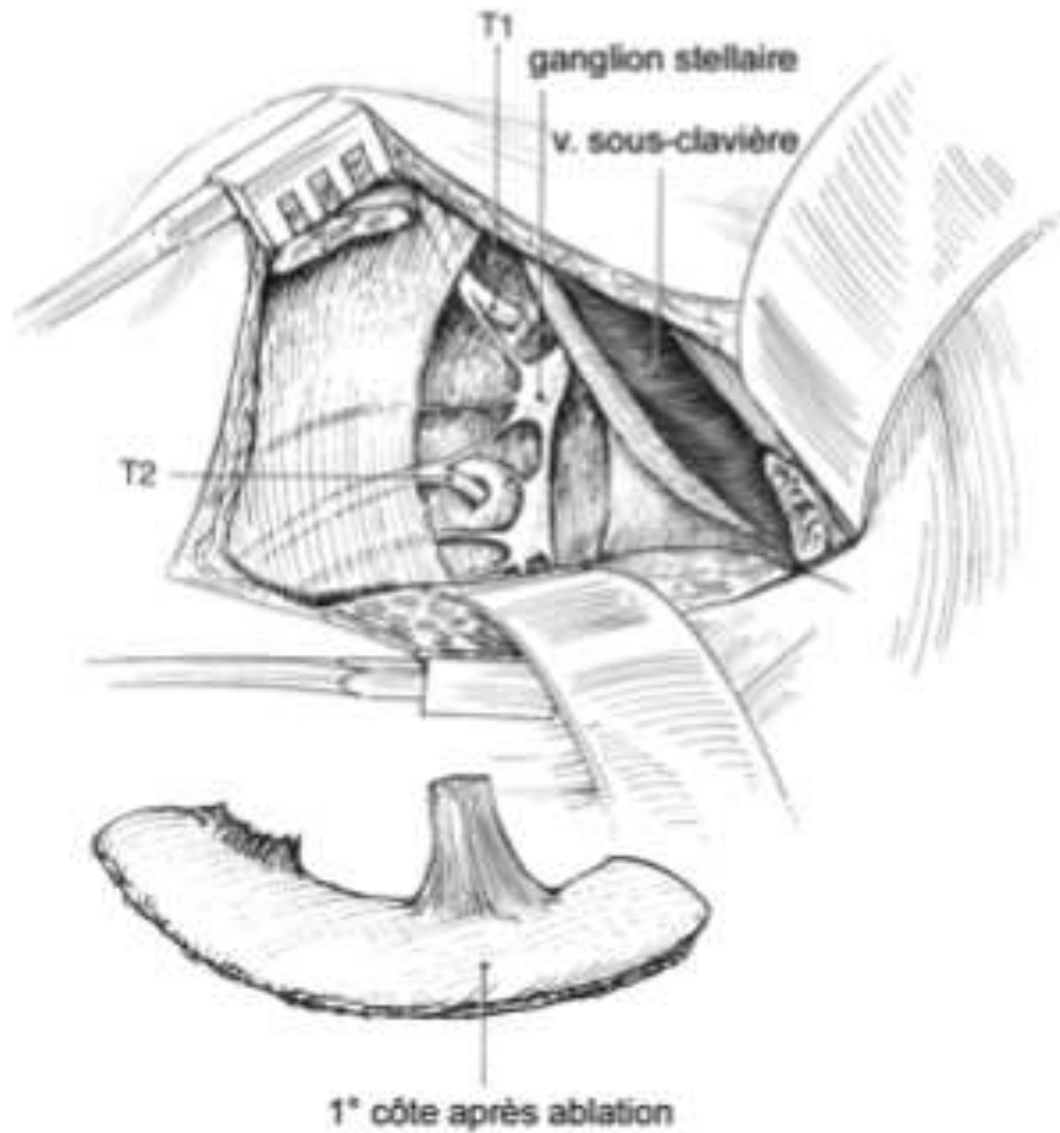
Voie axillaire



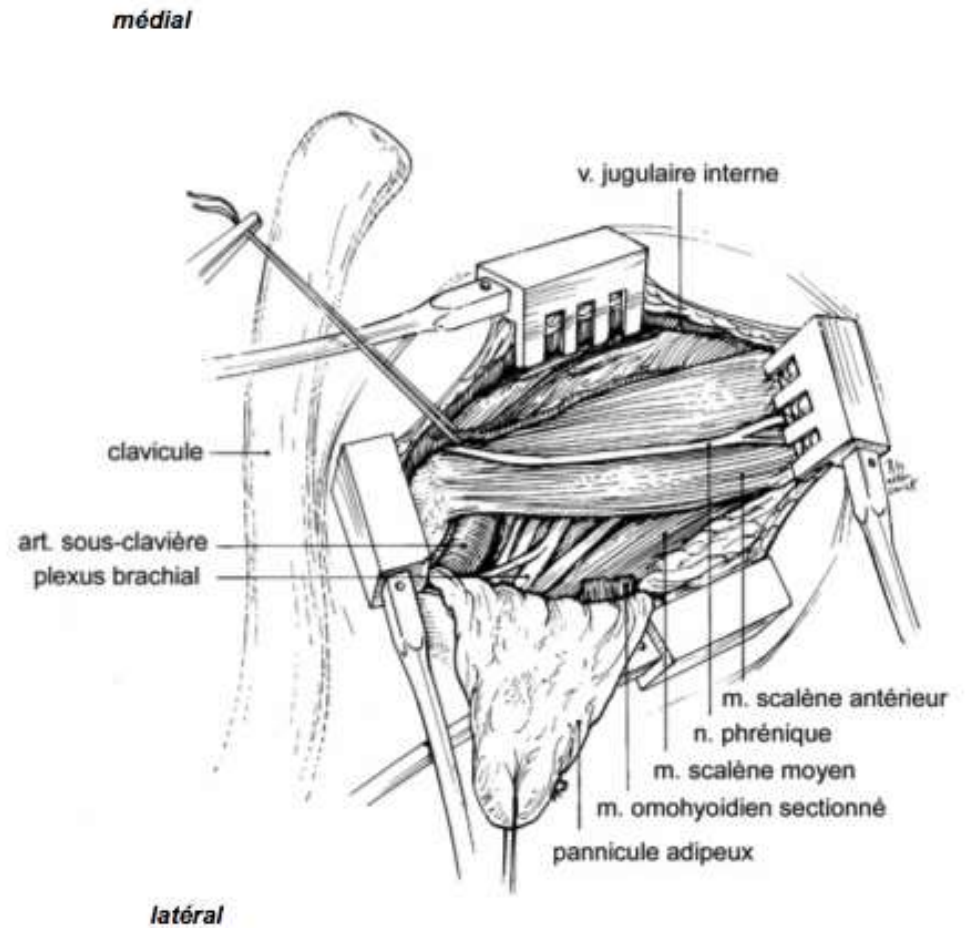
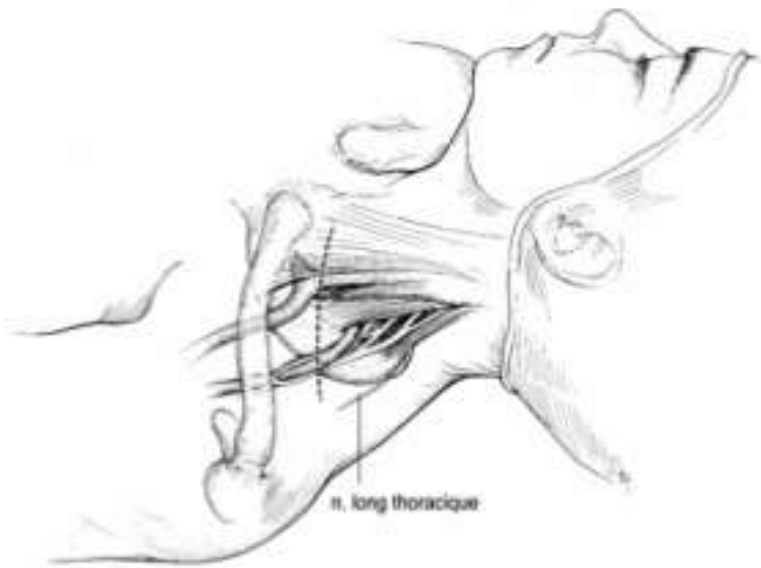
Voie axillaire



Voie axillaire

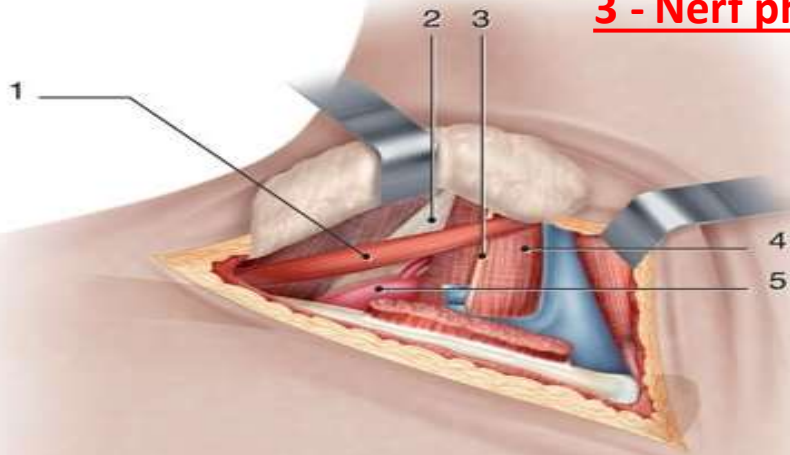


Voie sus-claviculaire

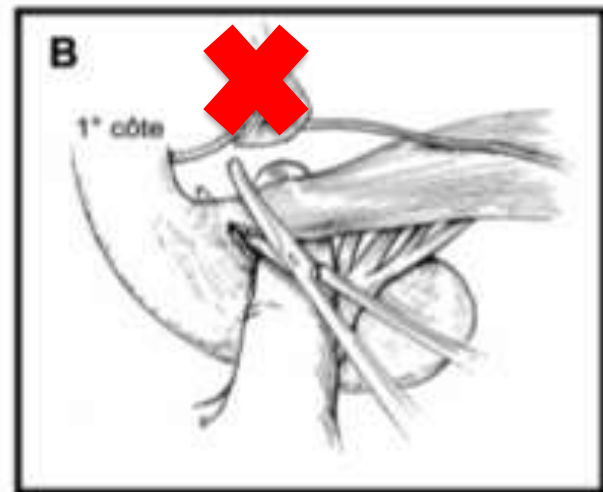
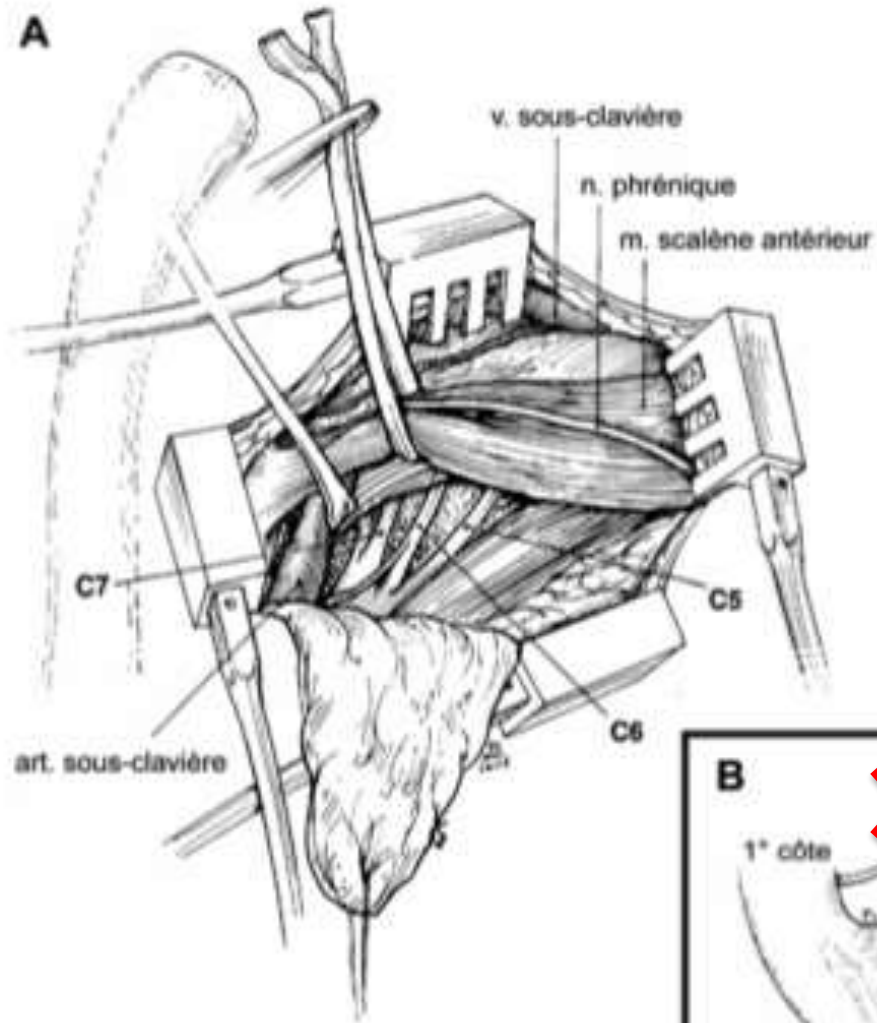


Voie sus-claviculaire

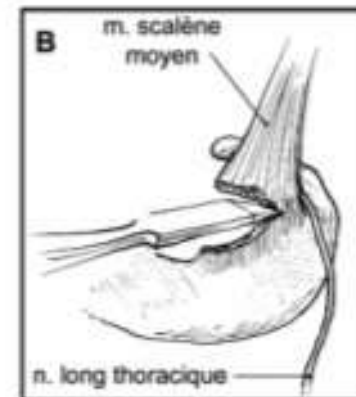
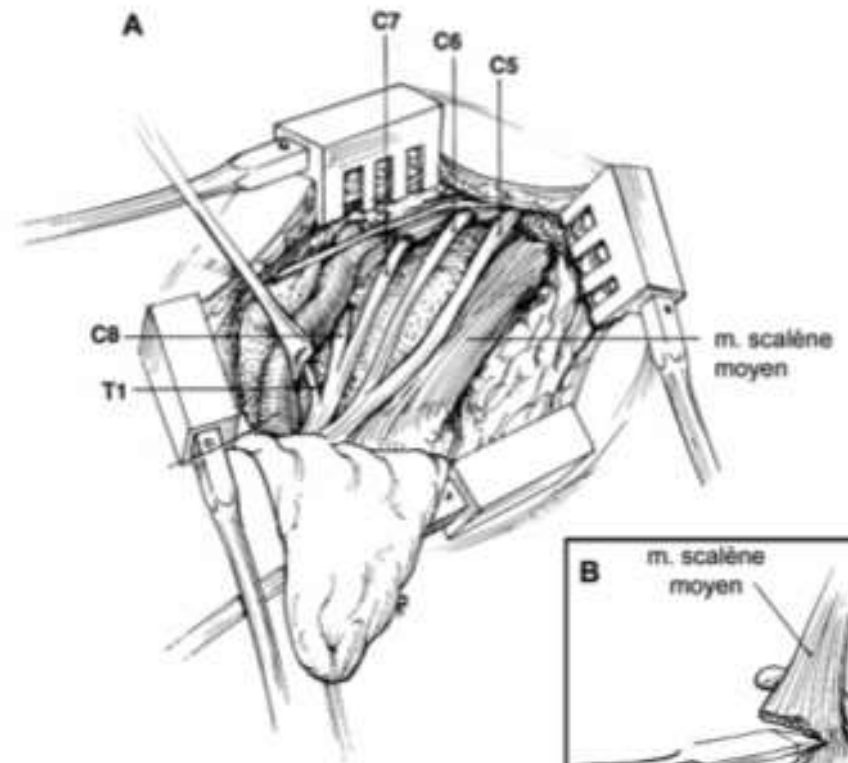
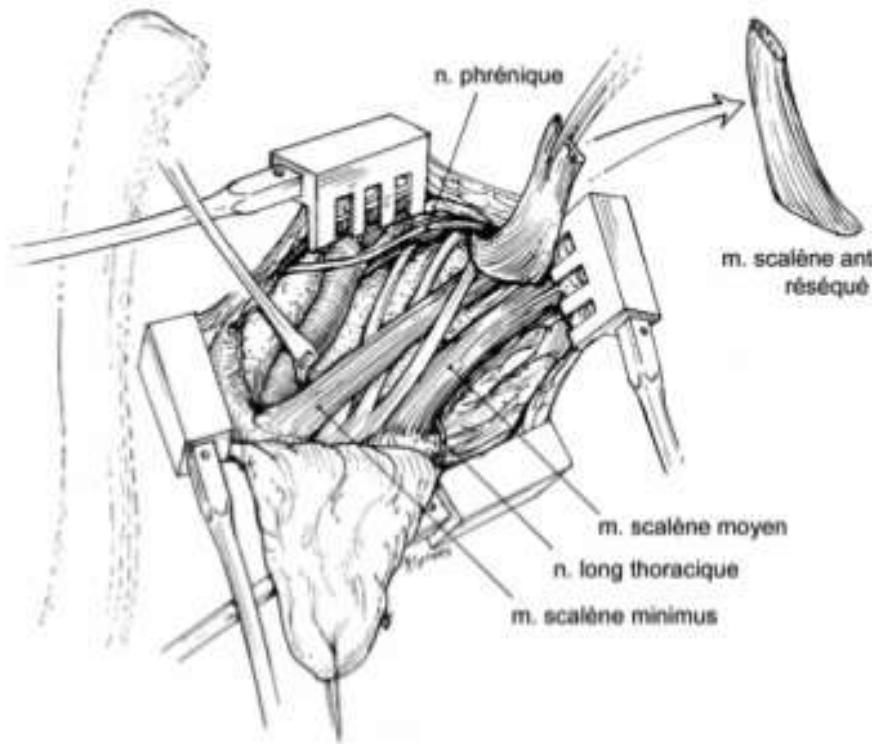
3 - Nerf phrénique



Voie sus-claviculaire



Voie sus-claviculaire



Voie sus-claviculaire



A

section des muscles
intercostaux



B

section antérieure
de la 1^{re} côte



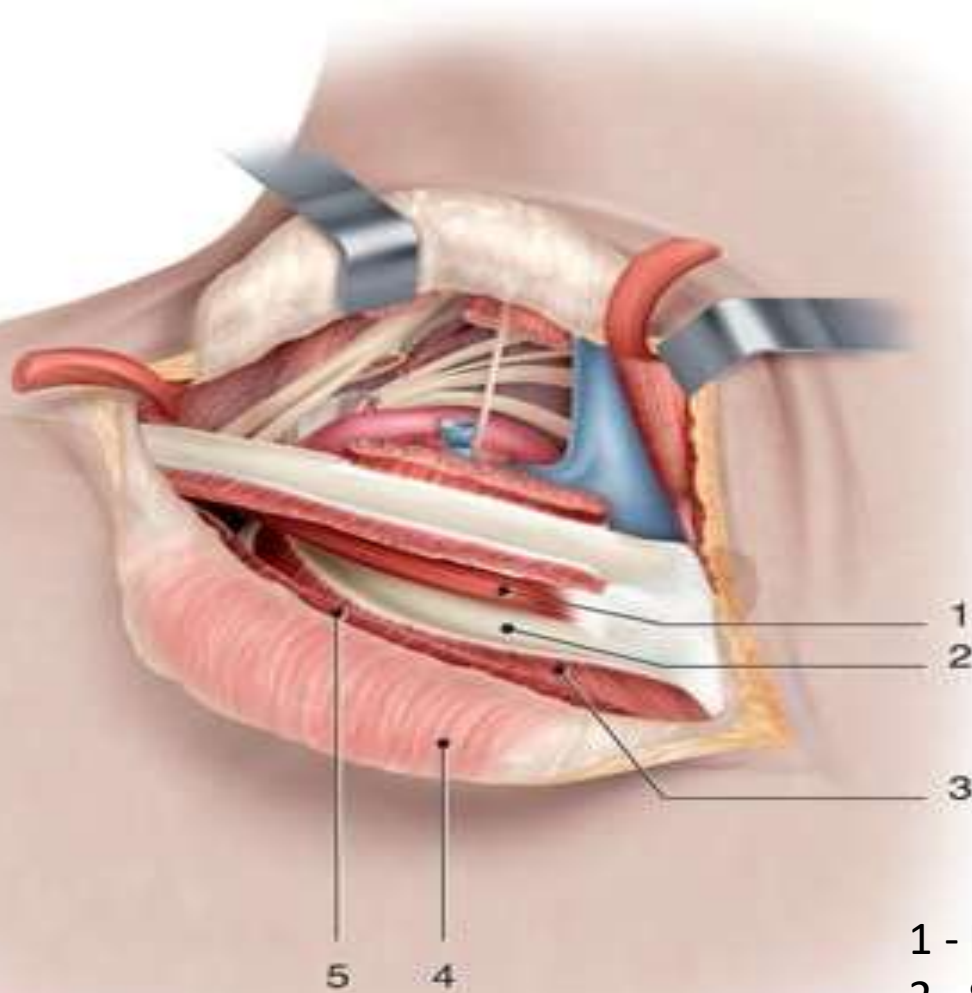
C

1^{re} côte
sectionnée



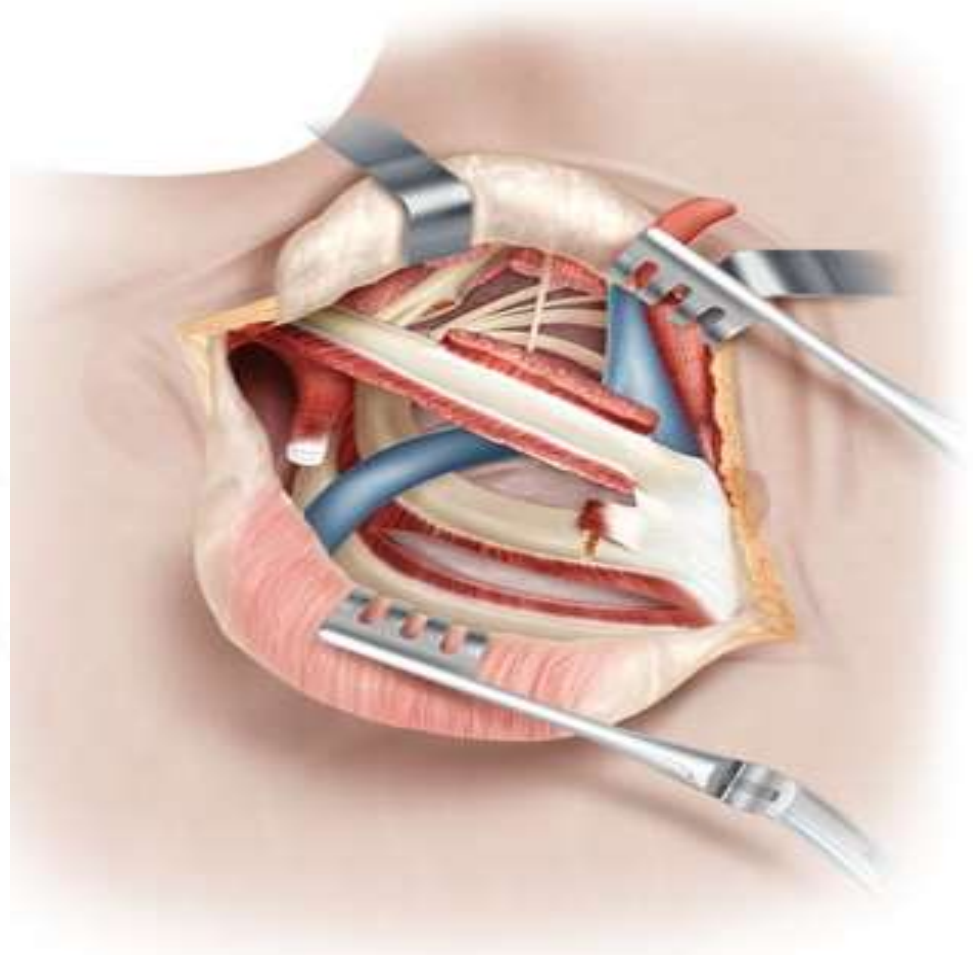
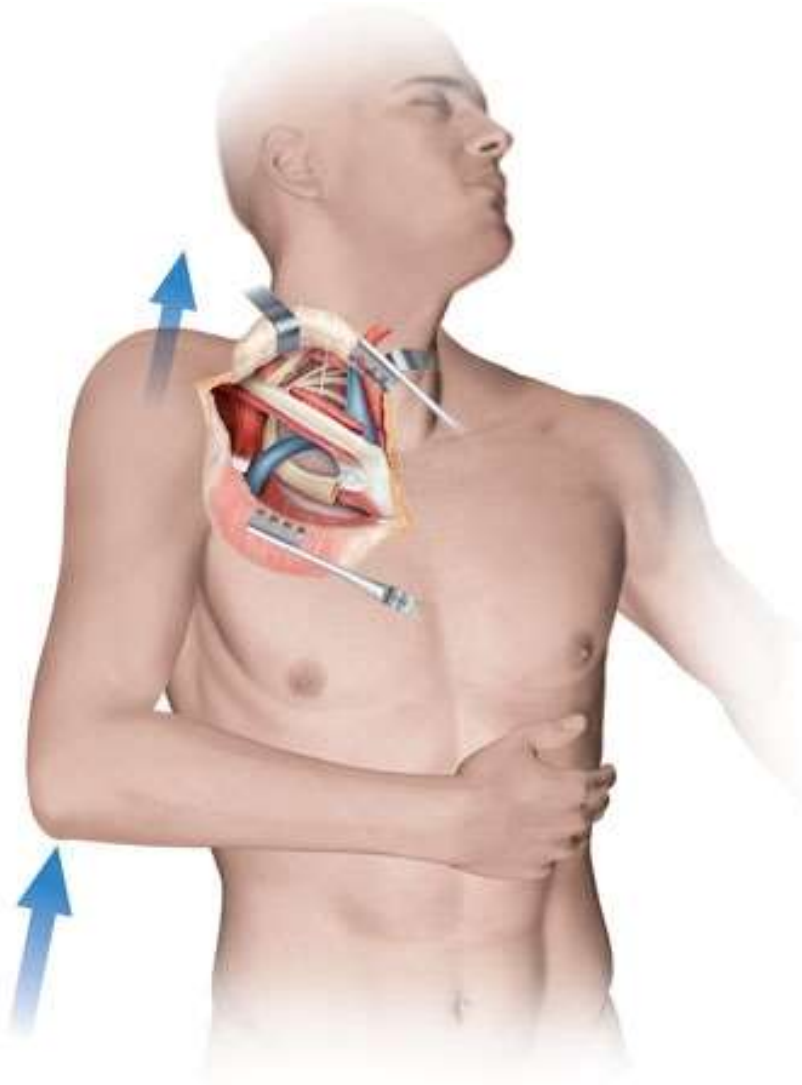
D

Voie sous-claviculaire



- 1 - Muscle sous-clavier
- 2 - Segment antérieur de la 1ère côte
- 3 - Muscle intercostal
- 4 - Muscle platysma
- 5 - Muscle grand pectoral

Voie sous-claviculaire



Voie axillaire de Roos

Avantages

- Libération veineuse +++
- Libération artérielle ++
- Esthétique
- Sympathectomie thoracique sup.

Inconvénients

- Difficile chez sujet obèse ou musclé
- Difficultés à réaliser un geste vasculaire complexe
- Arc postérieur de la 1^{ère} côte difficile d'accès
- Apprentissage

Formes vasculaires pures

Voie sus-claviculaire

Avantages

- Bonne exposition
- Libération du plexus brachial +++
- Exérèse facile des anomalies osseuses ou fibro-musculaires +++
- Geste artériel ++
- Sympathectomie thoracique

Inconvénients

- Esthétique
- Difficultés à réséquer l'arc antérieur de la 1^{ère} côte
- Libération veineuse
- Trauma. du nerf phrénique
- Trauma. du canal thoracique

***Formes neurologiques, formes compliquées,
avec anomalies ostéo-ligamentaires***

Voie sous-claviculaire

Avantages

- Geste veineux et même artériel complexe
- Exérèse facile de l'arc antérieur de la 1^{ère} côte

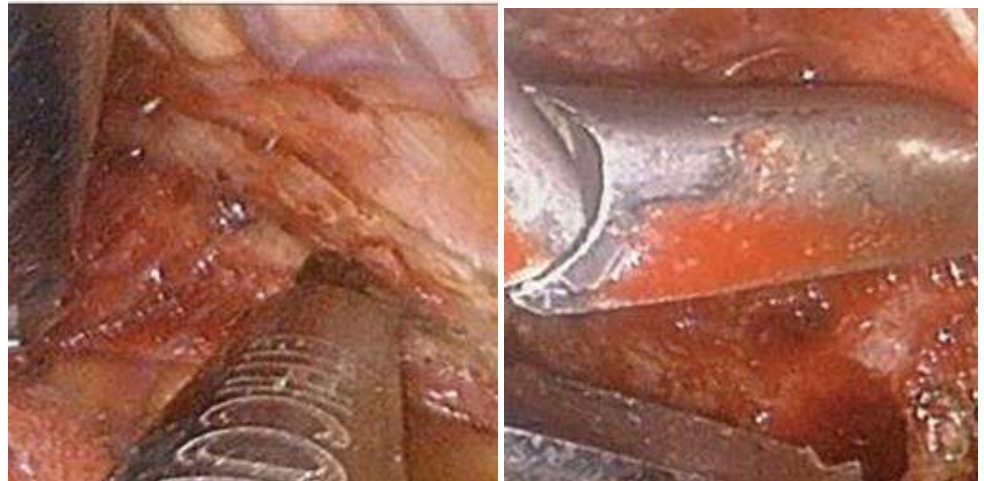
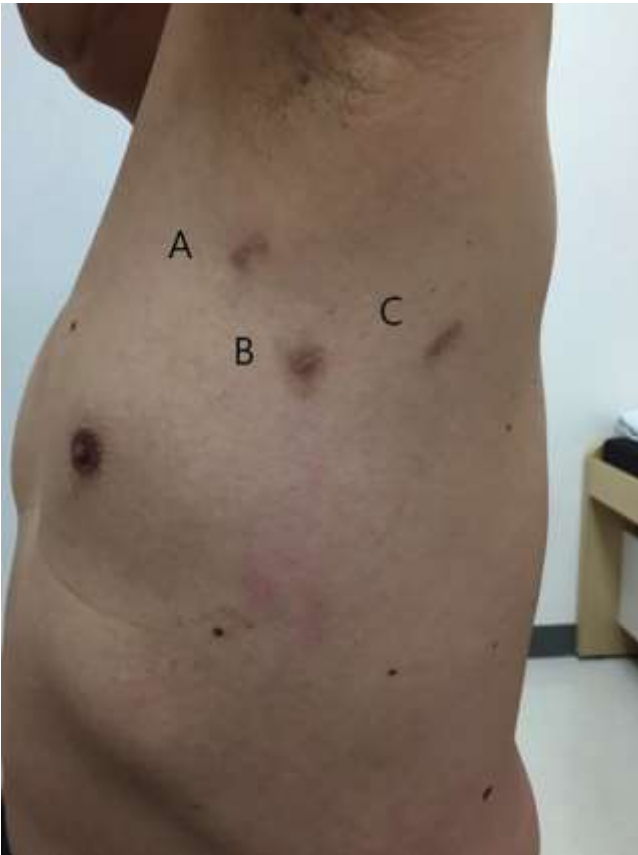
Inconvénients

- Esthétique +++
- Difficultés à réséquer l'arc postérieur de la 1^{ère} côte

Formes veineuses compliquées

**Totally Endoscopic (VATS) First Rib Resection for Thoracic Outlet Syndrome (10 cases).
RS George, Ann Thorac Surg 2017**

Video-assisted thoracoscopic surgery for intrathoracic first rib resection in thoracic outlet syndrome (8 cases). J Hwang, J Thorac Dis 2017

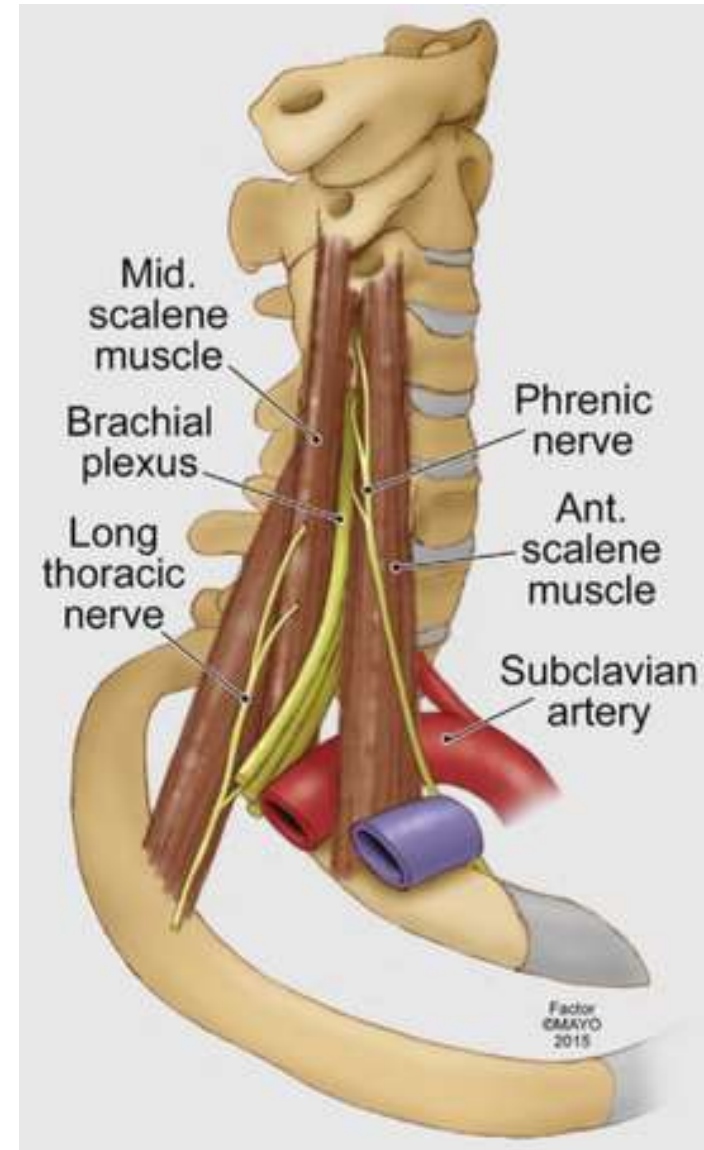
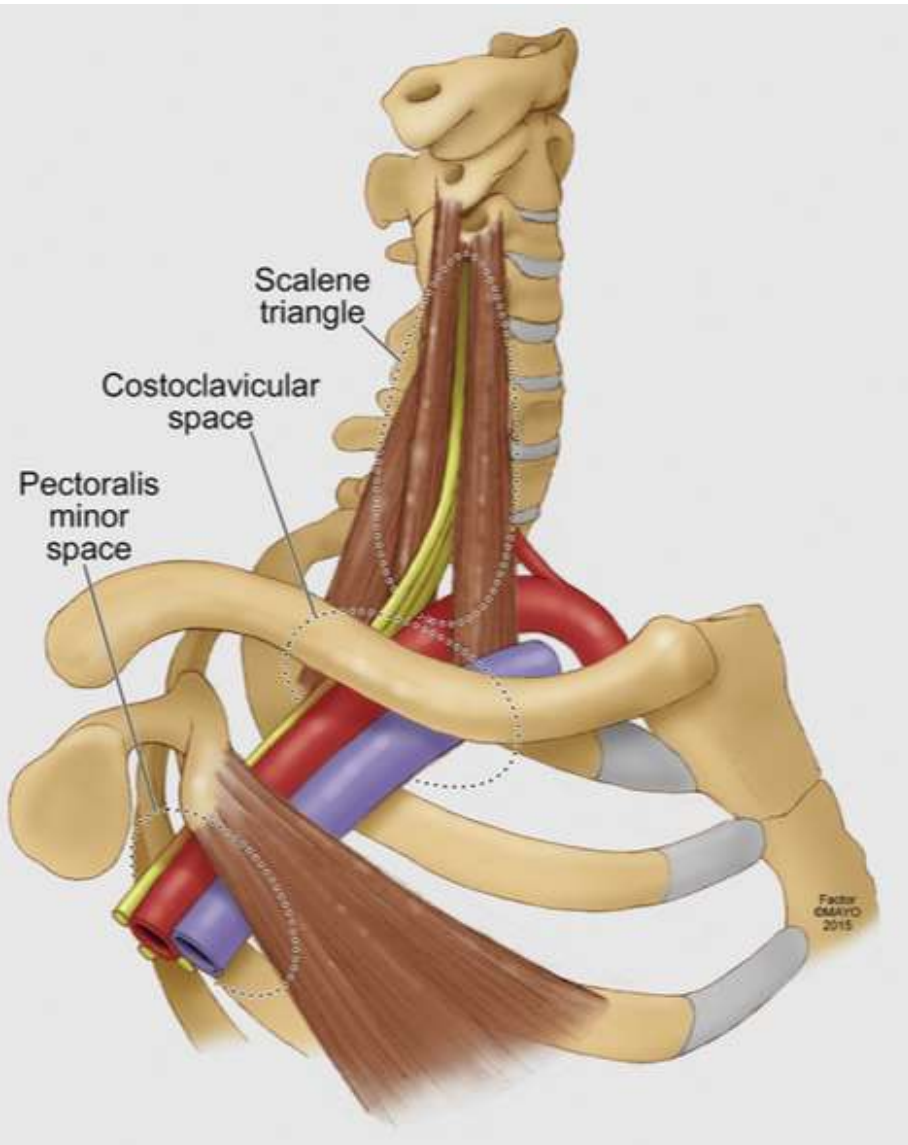


Complications post-opératoires

- Complications bénignes : lymphorrhée, hématome, pneumothorax, anesthésie face interne du bras
- Complications plus sérieuses : atteinte du phrénique, scapula alata, Claude Bernard Horner
- Complications graves (rares) : lésions vasculaires, paralysie du plexus (étirement, section des racines)
- Surtout non amélioration fonctionnelle à distance

Incidences médico-légales +++

Résultats



RESULTATS

- Revue de la littérature :
 - ❖ Aucune étude prospective, contrôlée
 - ❖ Courtes séries rétrospectives de centres spécialisés
- Impossible de conclure (Cochrane library)

Bilateral first rib resection and scalenectomy is effective for treatment of thoracic outlet syndrome

Danielle H. Rochlin, BA, Megan S. Orlando, BA, Kendall C. Likes, BA, Carly Jacobs, BA, and Julie A. Freischlag, MD, *Baltimore, Md*

JVS, 2014

Table I. Comparison of patient and clinical characteristics, by patient^a

	Neurogenic TOS (<i>n</i> = 25), No. (%)	Venous TOS (<i>n</i> = 26), No. (%)	Arterial TOS (<i>n</i> = 2), No. (%)
Mean age, years ^b	35	25	32
Gender			
Male	5 (20)	11 (42)	0 (0)
Female	20 (80)	15 (58)	2 (100)
Cervical ribs	4 (16)	2 (8)	2 (100)
Competitive athletes	2 (8)	7 (27)	0 (0)
Prophylactic	0 (0)	8 (31)	2 (100)

TOS, Thoracic outlet syndrome.
^aPatients are categorized on the basis of presentation on the first side.
^bAge at first surgery.

Table II. Comparison of outcomes, by side^a

	Neurogenic TOS (<i>n</i> = 55), No. (%)	Venous TOS (<i>n</i> = 39), No. (%)	Arterial TOS (<i>n</i> = 2), No. (%)
Resolved	44 (80)	29 (74)	2 (100)
Recurrent	2 (4)	9 (23)	0 (0)
Unresolved	8 (15)	0 (0)	0 (0)
Unknown	1 (2)	1 (3)	0 (0)

TOS, Thoracic outlet syndrome.
Percentages may not add to 100% because of rounding.
^aEach side is assigned an independent outcome. Prophylactic cases are excluded.

A Decade of Excellent Outcomes after Surgical Intervention in 538 Patients with Thoracic Outlet Syndrome

Megan S Orlando, BA, Kendall C Likes, BA, Serene Mirza, Yue Cao, Anne Cohen, Ying Wei Lum, MD, FACS, Thomas Reifsnyder, MD, FACS, Julie A Freischlag, MD, FACS

J Am Coll Surg, 2015

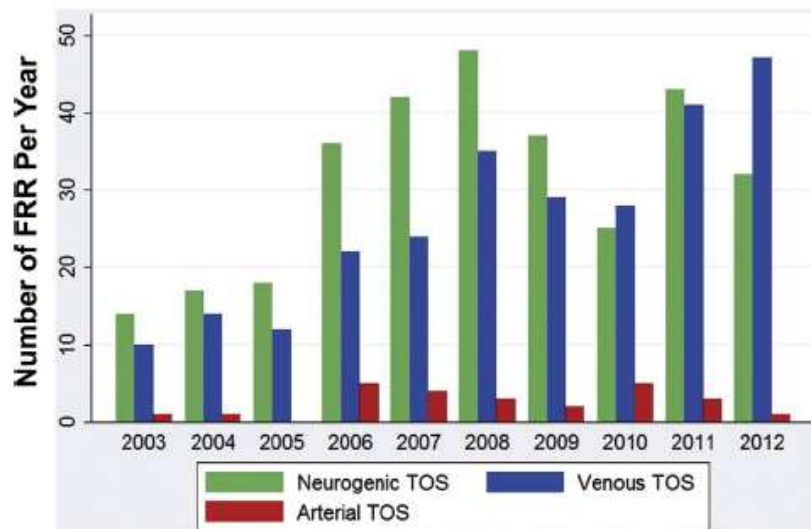


Figure 1. Number of first rib resections (FRR) per year by thoracic outlet syndrome (TOS) indication.

Table 3. Long-Term Outcomes of Patients Treated with First Rib Resection for All Indications of Thoracic Outlet Syndrome

Characteristic	Positive outcomes		Total, n
	n	%	
All patients	530*	95	557
Neurogenic TOS	281	93	301
Venous TOS	225	97	232
Arterial TOS	24	100	24
August 2003–July 2008	198	93	212
July 2008–August 2013	332	96	345

*There was insufficient follow-up in 37 cases (7 neurogenic TOS, 29 venous TOS, and 1 arterial TOS).
TOS, thoracic outlet syndrome.

Current practice of thoracic outlet decompression surgery in the United States

Elena K. Rinehardt, MD, John E. Scarborough, MD, and Kyla M. Bennett, MD, *Madison, Wisc*

ABSTRACT

Background: Thoracic outlet syndrome (TOS) and its management are relatively controversial topics. Most of the literature reporting the outcomes of surgical decompression for TOS derives from single-center experiences. The objective of our study was to describe the current state of TOS surgery among hospitals that participate in the American College of Surgeons National Surgical Quality Improvement Program database.

Methods: Our study sample consisted of patients from the 2005 to 2014 American College of Surgeons National Surgical Quality Improvement Program database who underwent first or cervical rib resection as their index procedure and whose constellation of diagnosis and procedure codes identified them as having neurogenic, arterial, or venous TOS. Patient and procedure characteristics were determined, as were the 30-day incidence of specific complications including nerve injury. Multimodel inference was used for multivariable analysis of the composite outcome of readmission or reoperation ≤ 30 days.

Results: We identified 1431 patients undergoing operation for TOS: 83% for neurogenic TOS, 3% for arterial TOS, and 12% for venous TOS. Vascular surgeons performed 90% of procedures. Only four patients (0.3%) demonstrated evidence of nerve injury. The rate of bleeding complication requiring transfusion was also quite low, at 1.4%. The 30-day incidence of readmission or reoperation, or both, in our study cohort was 8.6%. The risk of this outcome was increased in patients with a higher American Society of Anesthesiologists Physical Status Classification, those whose procedure was for non-neurogenic symptoms, and those whose procedure took longer to complete.

Conclusions: The findings of our study will provide surgeons who advocate for the surgical management of TOS with reassurance that such intervention is associated with an extremely low risk of disability resulting from iatrogenic nerve injury and major bleeding events. (*J Vasc Surg* 2017;66:858-65.)

Reporting standards of the Society for Vascular Surgery for thoracic outlet syndrome

Karl A. Illig, MD,^a Dean Donahue, MD,^b Audra Duncan, MD,^c Julie Freischlag, MD,^d Hugh Gelabert, MD,^e Kaj Johansen, MD,^f Sheldon Jordan, MD,^g Richard Sanders, MD,^h and Robert Thompson, MD,ⁱ *Tampa, Fla; Boston, Mass; London, Ontario, Canada; Sacramento and Los Angeles, Calif; Seattle, Wash; Aurora, Colo; and St. Louis, Mo*

Thoracic outlet syndrome (TOS) is a group of disorders all having in common compression at the thoracic outlet. Three structures are at risk: the brachial plexus, the subclavian vein, and the subclavian artery, producing neurogenic (NTOS), venous (VTOS), and arterial (ATOS) thoracic outlet syndromes, respectively. Each of these three are separate entities, though they can coexist and possibly overlap. The treatment of NTOS, in particular, has been hampered by lack of data, which in turn is the result of inconsistent definitions and diagnosis, uncertainty with regard to treatment options, and lack of consistent outcome measures. The Committee has defined NTOS as being present when three of the following four criteria are present: signs and symptoms of pathology occurring at the thoracic outlet (pain and/or tenderness), signs and symptoms of nerve compression (distal neurologic changes, often worse with arms overhead or dangling), absence of other pathology potentially explaining the symptoms, and a positive response to a properly performed scalene muscle test injection. Reporting standards for workup, treatment, and assessment of results are presented, as are reporting standards for all phases of VTOS and ATOS. The overall goal is to produce consistency in diagnosis, description of treatment, and assessment of results, in turn then allowing more valuable data to be presented. (J Vasc Surg 2016;64:e23-e35.)

Conclusion

- Geste chirurgical assez complexe, source de conflits
- Excellents résultats dans la littérature, par des équipes entraînés (niveau de preuve faible)
- Bien informer les patients +++
- Facteurs d'échec : \$ dépressif, patients ayant un avocat en préopératoire

Merci de votre attention

