16 mai 2025

XXXVIIe congrès ANMSR

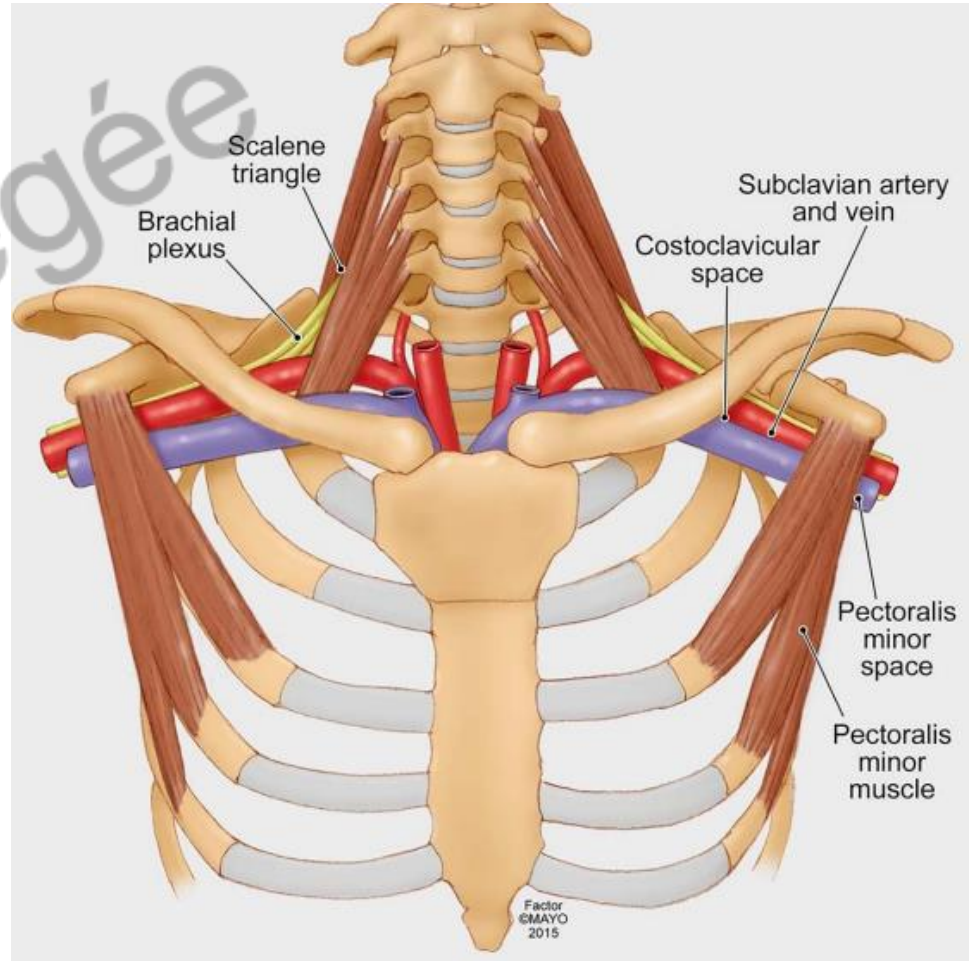
Rééducation du syndrome du défilé CTB

Arnaud Dupeyron, MD, PhD

Université de Montpellier, CHU de Nîmes, Laboratoire Euromov-DHM

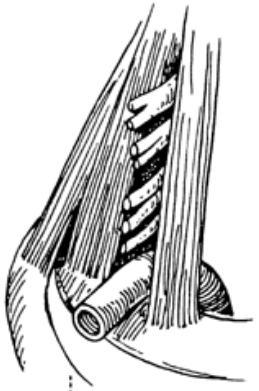
Définition

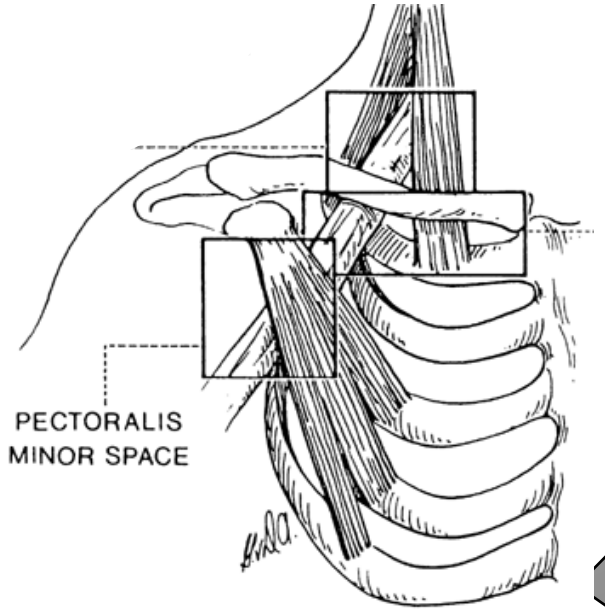
- It is defined as a compression injury to the brachial plexus, subclavian artery or vein, or axillary artery or vein occurring between the cervical spine and upper extremity.

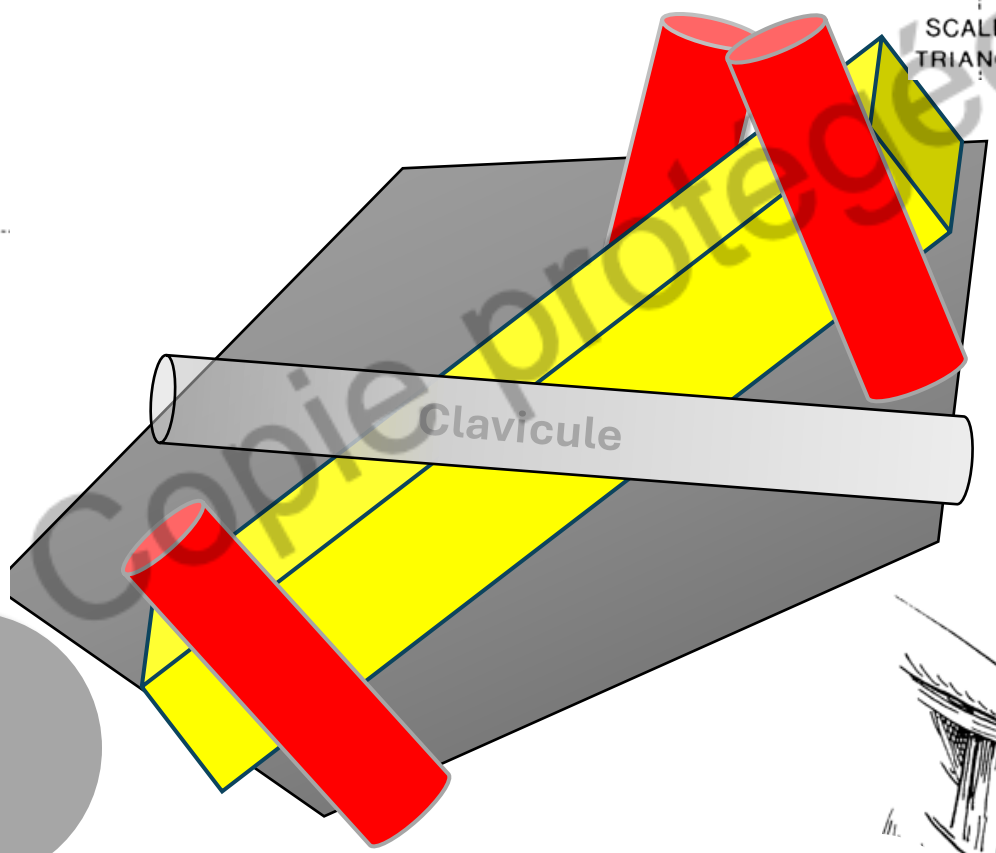


Anatomie

Triangle Scalènique

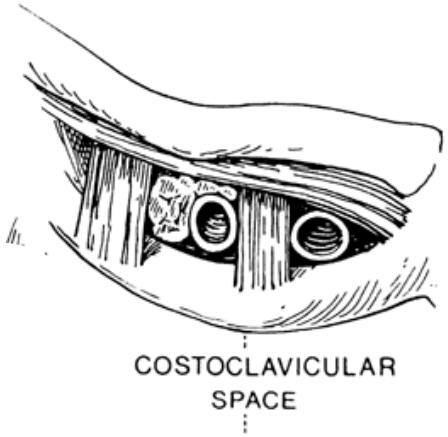






Canal costo claviculaire

Tunnel pectoral



Clinique

- Imprécise
- Fluctuante
- Trompeuse

Engourdissement et/ou picotements dans le bras affecté
Mains froides et décoloration bleu pâle du bout des doigts
Douleur et gonflement du cou, du bras et de la main
Douleurs positionnelles
Faiblesse des muscles du membre concerné
Absence ou faiblesse du pouls

Clinique

- Imprécise
- Fluctuante
- Trompeuse

SPCTB **CHU Nîmes** **2013**

PROCEDURE DEVAREED
Evaluation du Passage Cervico-Thoraco-Brachial (PCTB) Vasculaire -Rééducation
ATTENTION : Pour chaque item positif, préciser la durée en secondes (s)

Etiquette patient

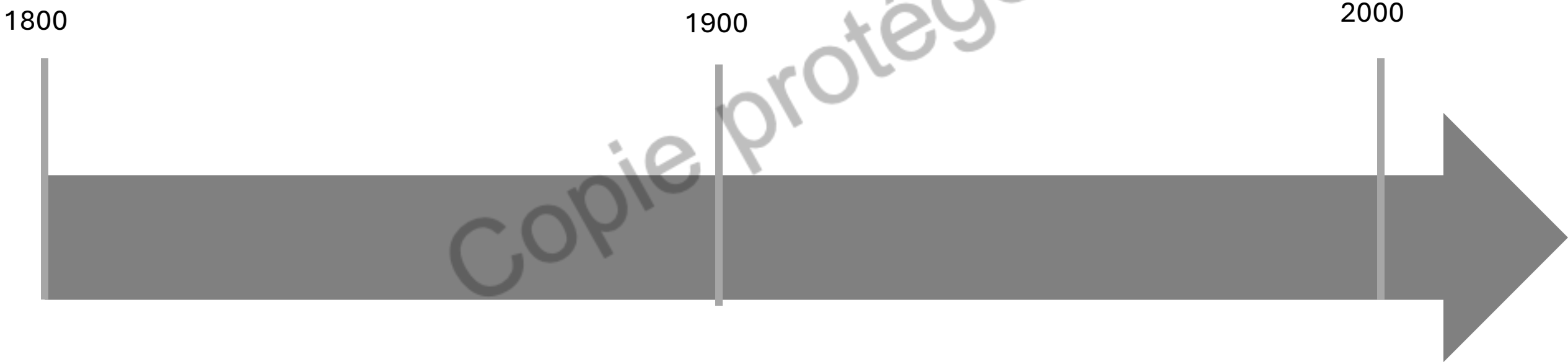
Date : / / 201

Suspicion de Syndrome du PCTB	**Droit**	**Gauche**
Symptôme dominant :	_____	_____
Ancienneté (mois)	_____	_____
1. Wright : Elévation passive du bras dans le plan frontal		
30°/60°/90°/120°(préciser)	_____°	_____°
Disparition du Pouls	☐ : ____ s	☐ : ____ s
Apparition d'un souffle	☐ : ____ s	☐ : ____ s
Reproduit la douleur	☐ : ____ s	☐ : ____ s
2. Adson : Rotation homolatérale du cou + inspiration		
Disparition du Pouls	☐ : ____ s	☐ : ____ s
Apparition d'un souffle	☐ : ____ s	☐ : ____ s
Reproduit la douleur	☐ : ____ s	☐ : ____ s
3. Haut les mains (Elévation active) :		
Disparition du Pouls	☐ : ____ s	☐ : ____ s
Apparition d'un souffle	☐ : ____ s	☐ : ____ s
Reproduit la douleur	☐ : ____ s	☐ : ____ s
4. Roos : bras à 90°, coudes à 90°, Flexion/Extension des doigts pendant 3min		
Reproduit la douleur	☐ : ____ s	☐ : ____ s
5. Autres : décrire la position brachiale et cervicale		
Disparition du Pouls	☐ : ____ s	☐ : ____ s
Apparition d'un souffle	☐ : ____ s	☐ : ____ s
Reproduit la douleur	☐ : ____ s	☐ : ____ s




Demande d'étude dynamique vasculaire préférentiellement en position n° _____

Genèse d’un syndrome et de son traitement

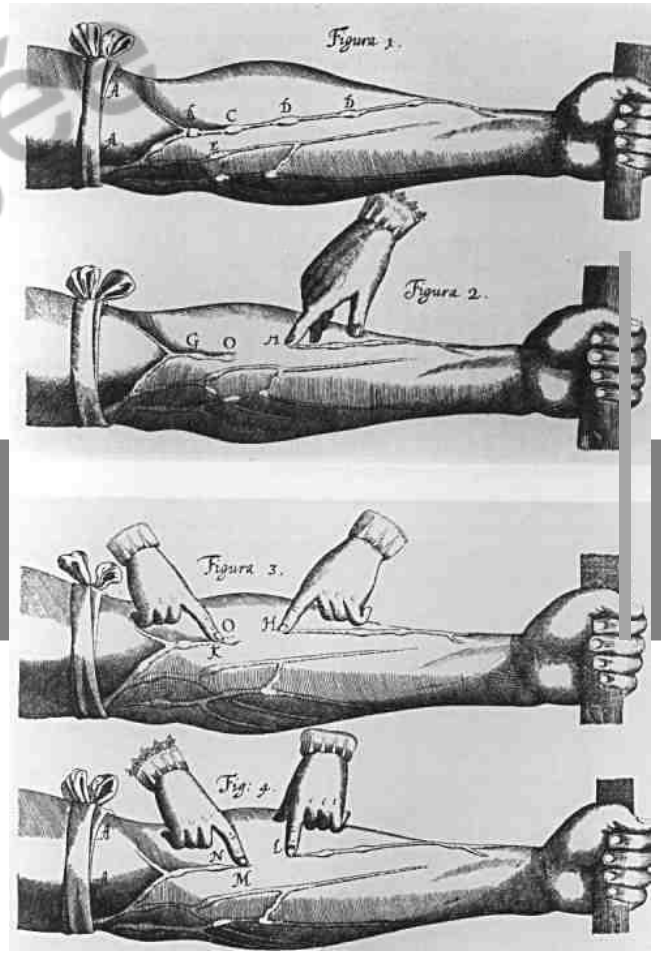


Genèse d’un syndrome et de son traitement

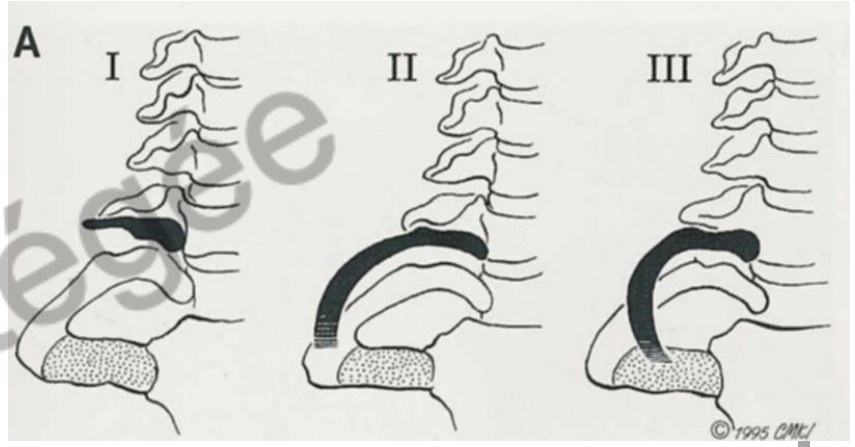
Sir Astley Cooper

1821

1ère description de gangrène digitale attribuée à une compression vasculaire par une côte cervicale



Genèse d’un syndrome et de son traitement



Résection première cote

Coote

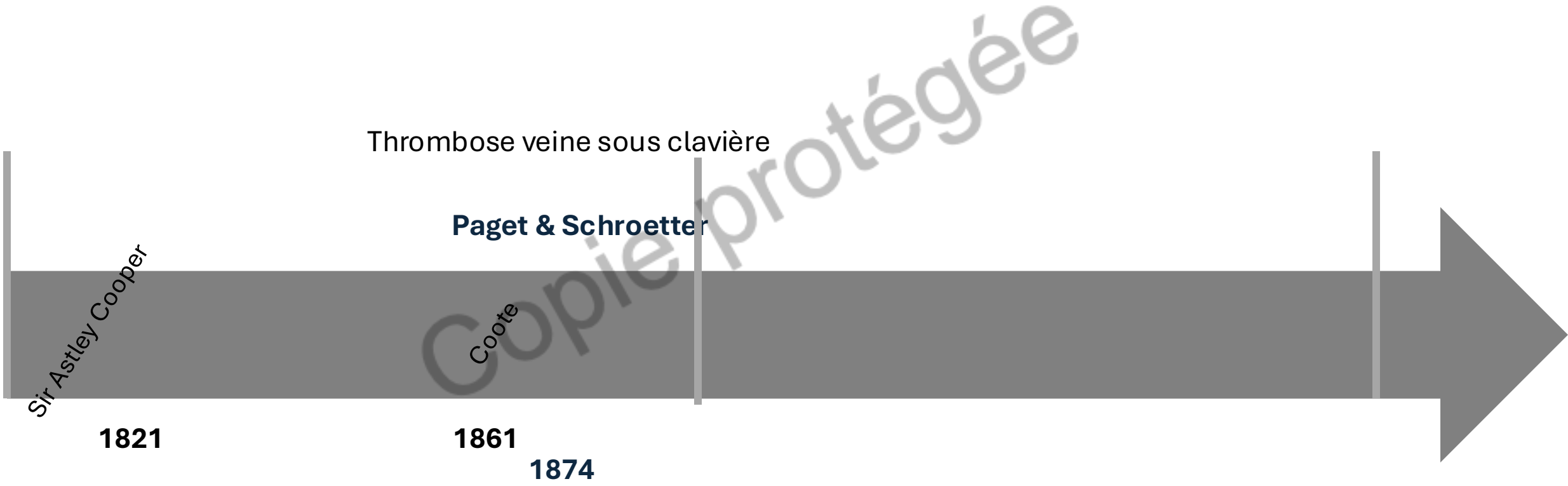
Sir Astley Cooper

1821 **1861**

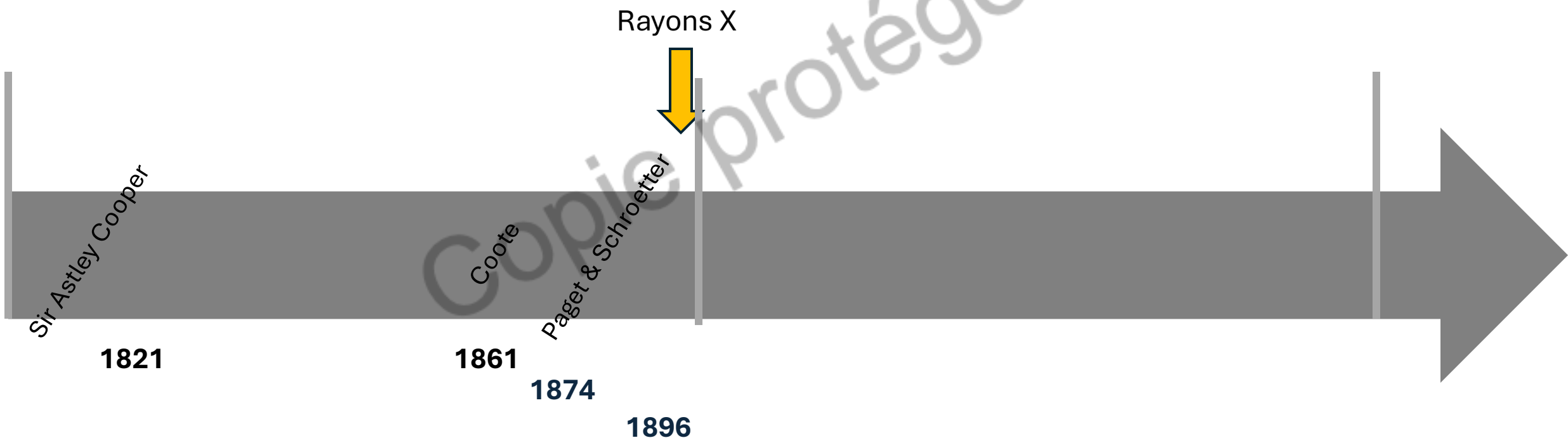
« the region was not a pleasant one for any procedure requiring the use of knife »

Coote, **H**. Exostosis of the left transverse process of the seventh **cervical** ... **Lancet**.**1861**;1:360–361

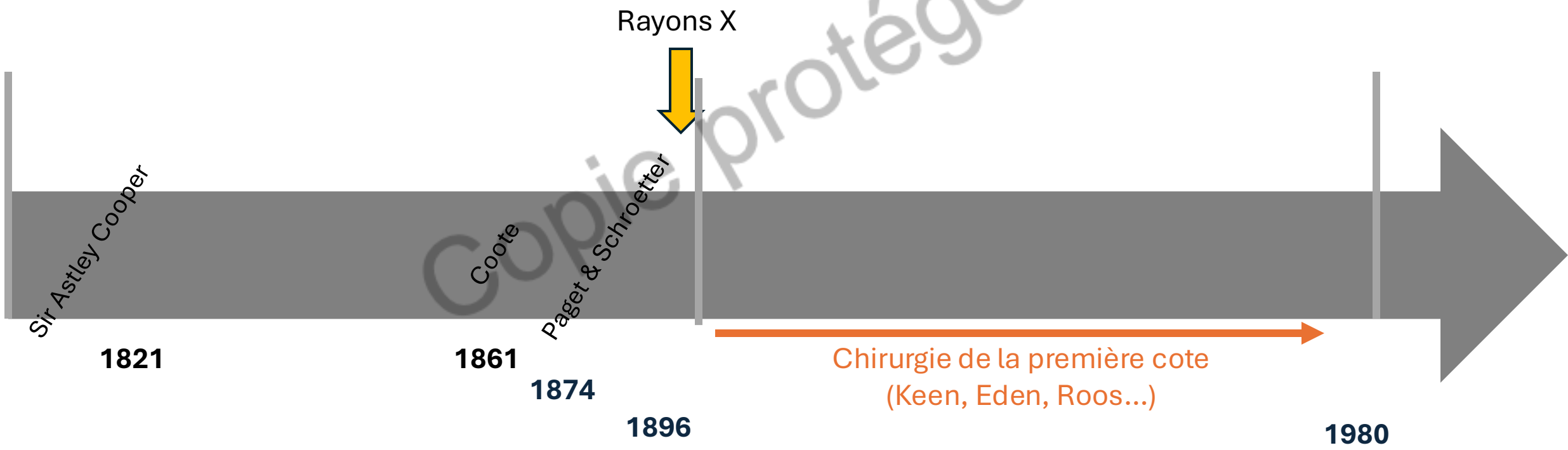
Genèse d’un syndrome et de son traitement



Genèse d’un syndrome et de son traitement



Genèse d'un syndrome et de son traitement



Genèse d'un syndrome et de son traitement

Sir Astley Cooper

1821

Coote

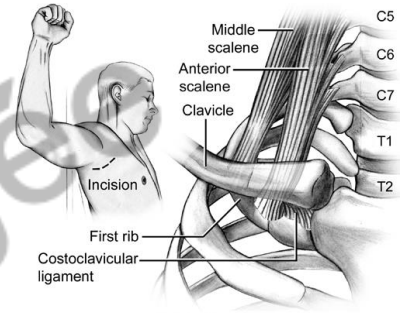
1861

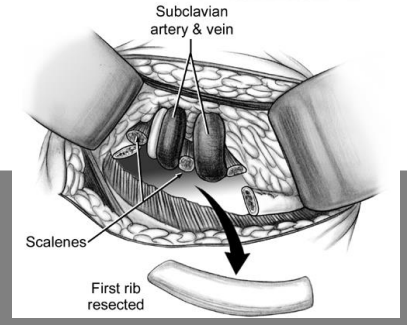
Paget & Schroetter

1874

Rayons X

1896





Chirurgie de la première cote

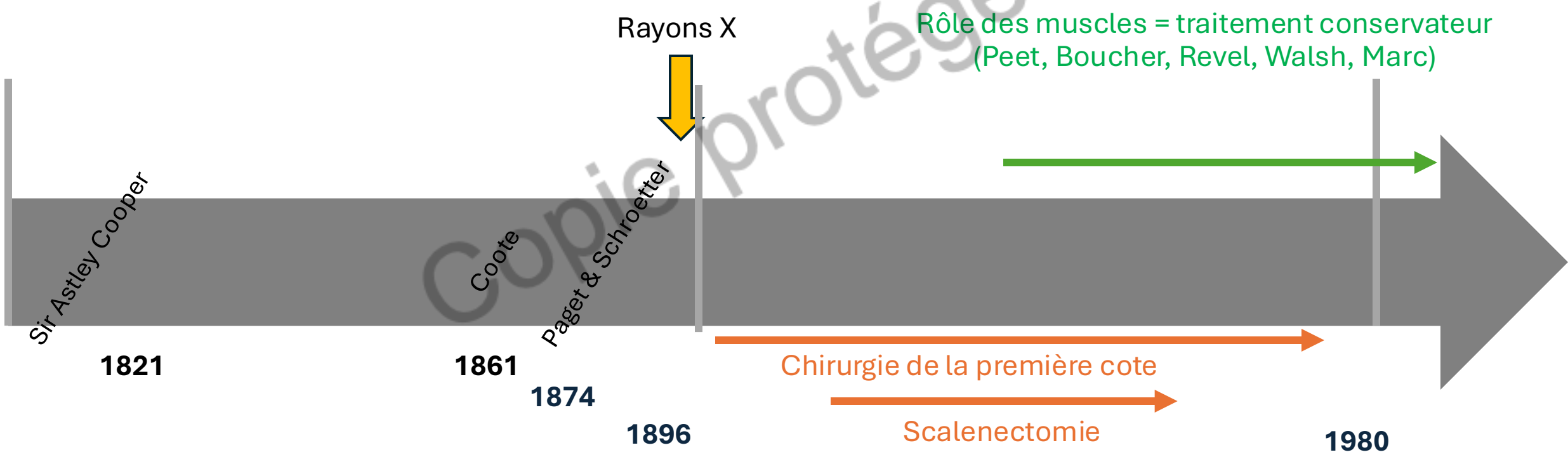
1927

Scalenectomie (Adson et Coffey)

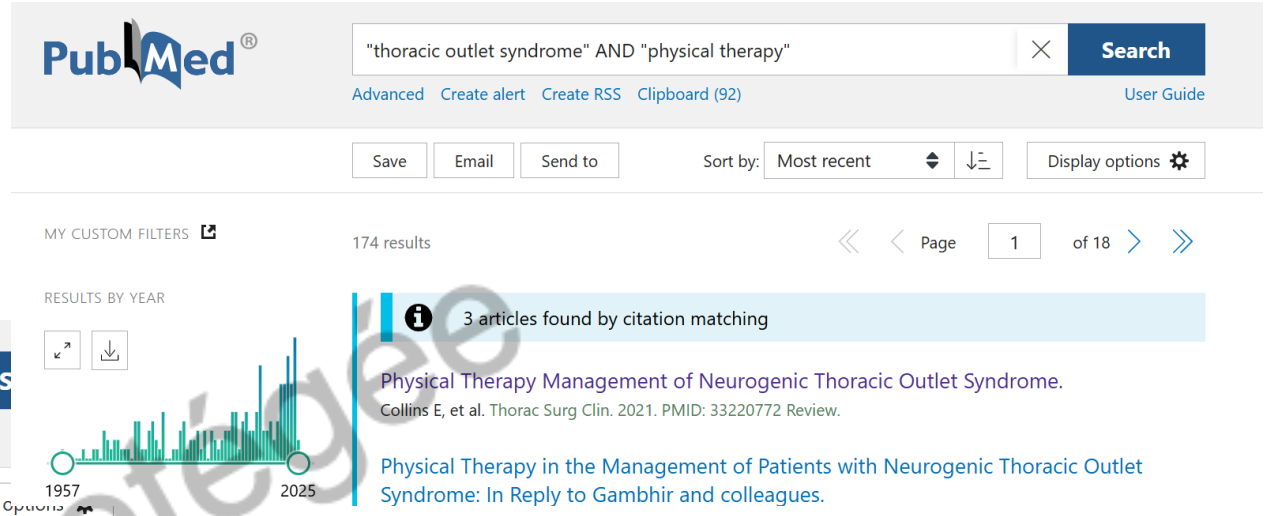
1962

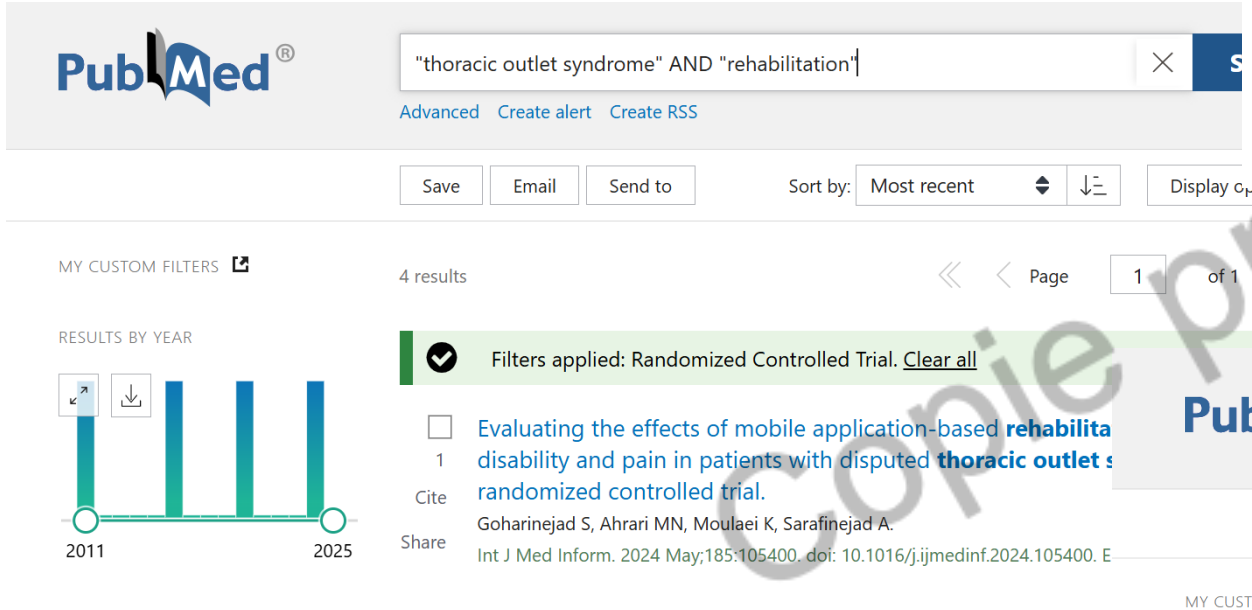
1980

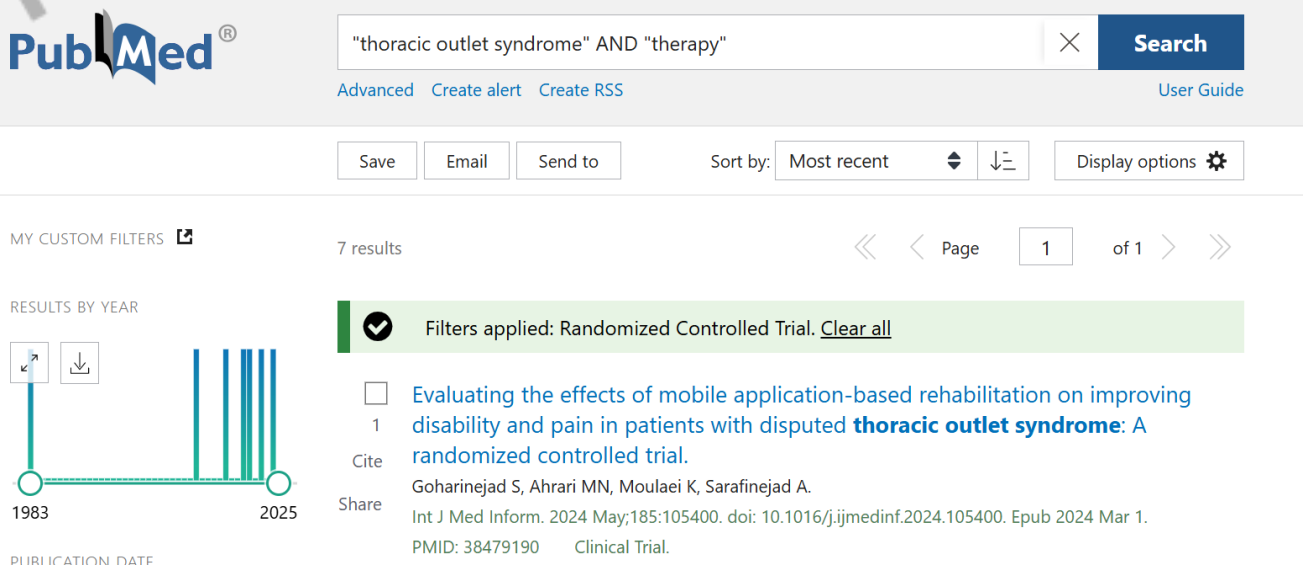
Genèse d'un syndrome et de son traitement



Que dit la littérature?

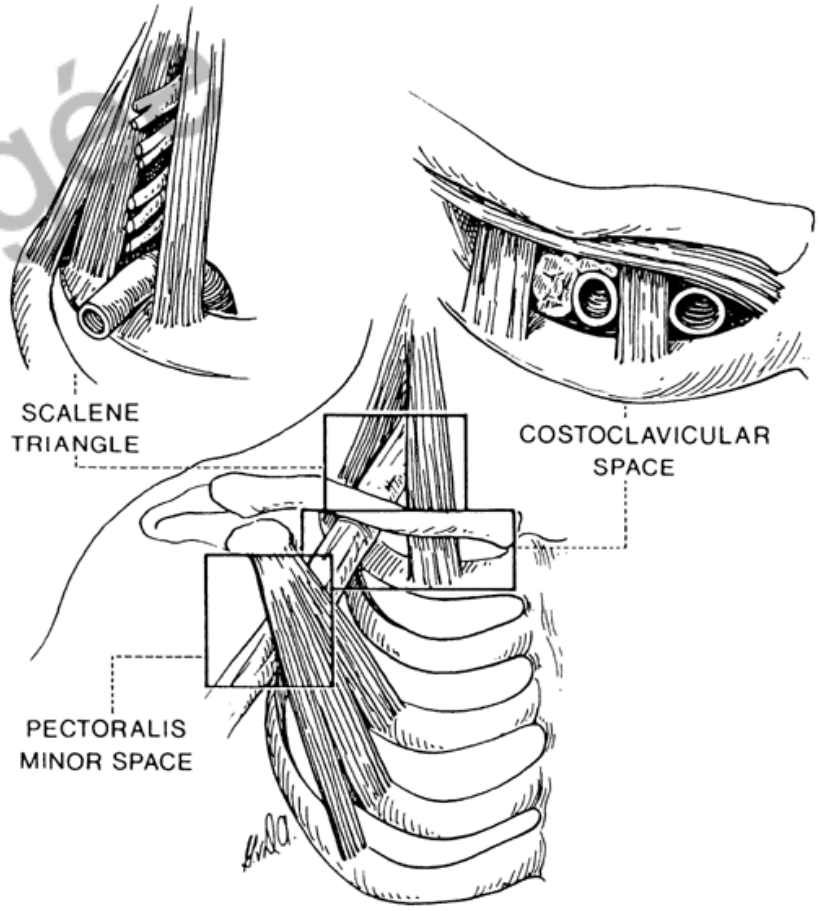






Revenir aux fondamentaux

- Déficiences musculaires
  - Déficit musculaire = renforcer
  - Rétraction = étirer
  - Douleur = antalgie
- Fonction
  - Mobilité et coordination
  - Contrôle et respiration
  - Correction posturale
- Handicap



Traitement physique

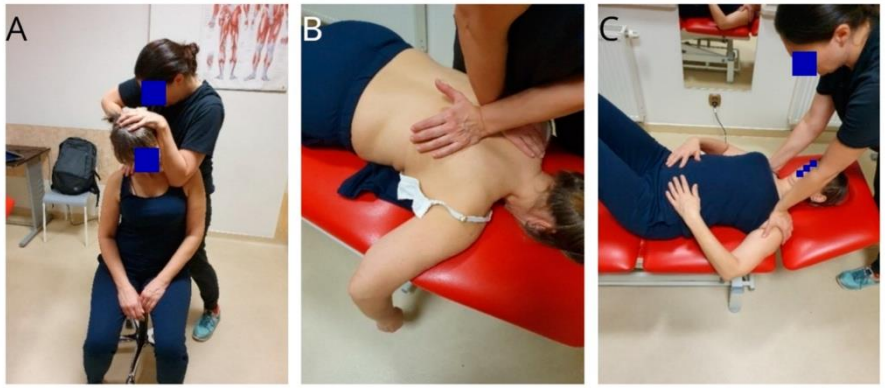
WALSH

- Soft Tissue Mobilization or Manual Therapy
  - La participation musculaire
  - Méthodes:
    - Pression directe douce, frottements superficiels, mobilisation assistée
    - Massage profond
    - Ponction aiguille sèche scalene, grand dorsal, petit pectoral

Traitement physique

MARC

- Mobilisation articulaire
  - Première cote
  - Rachis cervical / junction CD / rachis dorsal
  - Epaule = gléno humérale et scapulo thoracique

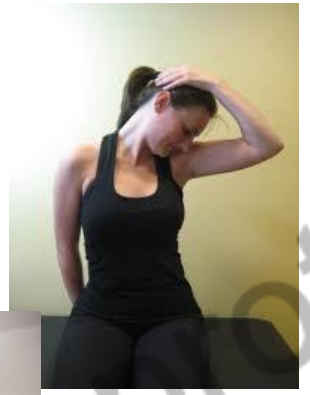


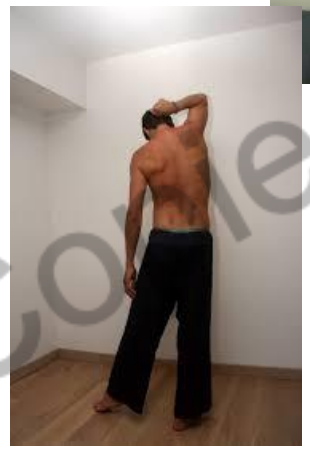
Traitement physique

PEET

Etirements

- Grand et petit pectoral
- Scalenes
- Grand dorsal
- Sous-clavier





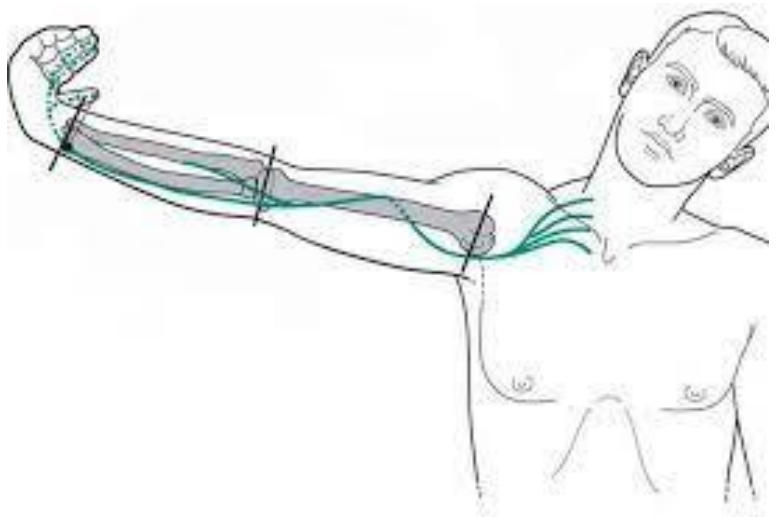
Renforcement

- Trapeze supérieur
- Elevateur scapula
- Grand dentelé

- Contracté – relâché
- Facilitation proprioceptive neuromusculaire

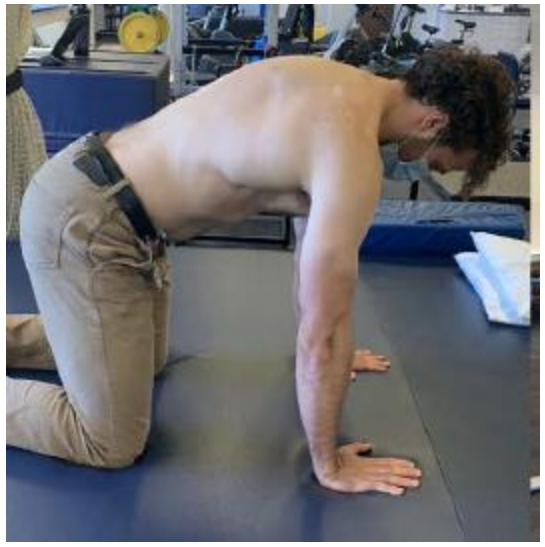
Traitement physique

- Neural mobilisation
  - Réduit les adhésions des nerfs aux tissus environnants



Exercices

- Exercices thérapeutiques
  - Certains décrivent une progression de la rééducation axée sur le contrôle de la scapula dans différents degrés d'abduction



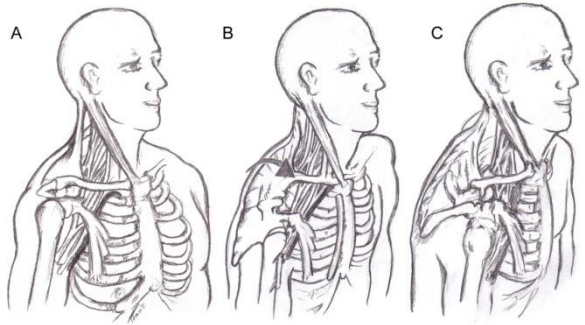
Exercices

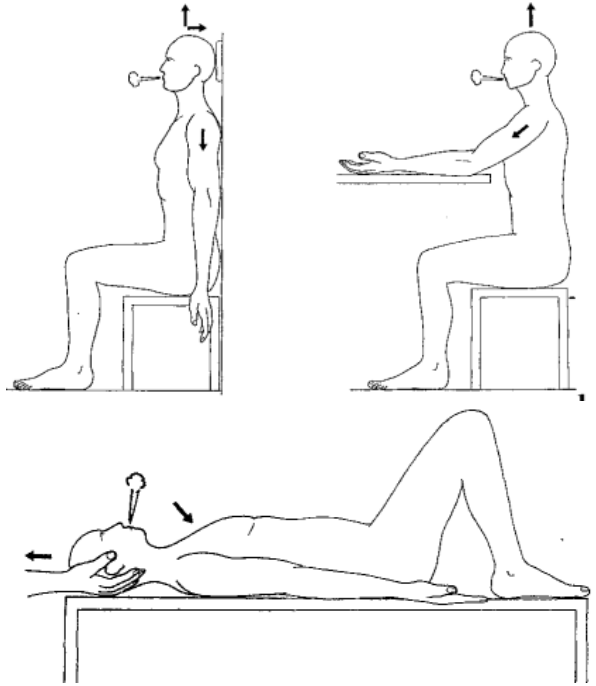
- Exercices thérapeutiques
  - D’autres des exercices couplés permettant un renforcement synergique avec la respiration

Programme de rééducation

- Respiration et gainage
  - Les stratégies respiratoires accessoires = hypertrophie des scalènes, sterno-cléido-mastoïdiens, et du trapèze.
  - Respiration diaphragmatique et costale inférieure
  - Associé au gainage

- Posture





Instrumental

- BFR
  - Crée une condition d’ischémie et hypoxie musculaire, provoquant des niveaux élevés de stress métabolique en combinaison avec l'exercice
  - Neuf études n'ont rapporté aucun effet indésirable, tandis que trois ont fait état d'effets indésirables rares, notamment une thrombose veineuse profonde du membre supérieur et une rhabdomyolyse.
  - Bien pour le genou…

Clinical Sports Medicine Update

The Safety of Blood Flow Restriction Training as a Therapeutic Intervention for Patients With Musculoskeletal Disorders

A Systematic Review

Melissa C. Minniti,[*†] SPT, Andrew P. Statkevich,[†] SPT, Ryan L. Kelly,[†] SPT, Victoria P. Rigsby,[†] SPT, Meghan M. Exline,[†] SPT, Daniel I. Rhon,[‡§] PT, DSc, and Derek Clewley,[†] PT, DPT, PhD
Investigation performed at Duke University, Durham, North Carolina, USA

Autres interventions

- Taping

Effects of Kinesio Taping on pain, paresthesia, functional status, and overall health status in patients with symptomatic thoracic outlet syndrome: A single-blind, randomized, placebo-controlled study

Emine Aygül Ortaç, Tunay Sarpel, İlke Coşkun Benlidayı

Department of Physical Medicine and Rehabilitation, Çukurova University, School of Medicine, Adana, Turkey

Table 2. Between-group comparison of changes in outcome measures over time

	t0-t1		t1-t2		t0-t2	
	KT	Placebo KT	KT	Placebo KT	KT	Placebo KT
VAS for pain (0–10)	3 (0–10)***	0 (-3 to 6)	-1 (-6 to 4)	0 (-3 to 2)	2.5 (-1 to 8)***	0 (-1 to 6)
VAS for paresthesia (0–10)	3 (-1 to 7)*	1 (-1 to 8)	0 (-4 to 3)	0 (-5 to 3)	2 (-1 to 6)*	0 (-1 to 6)
DASH (0–100)	17.6 (-5.8 to 45.8)***	1.6 (-14.4 to 23.3)	0 (-28.3 to 23.3)	-0.4 (-15 to 17.5)	8.8 (-18.3 to 47.5)***	-0.6 (-17.44 to 17.44)

Médicamenteux

- Injection TOXIN

PAIN® 152 (2011) 2023–2028

PAIN®

www.elsevier.com/locate/pain

Botulinum toxin injection for management of thoracic outlet syndrome: A double-blind, randomized, controlled trial

Heather C. Finlayson [a,b,*], Russell J. O'Connor [a,b], Penelope M.A. Brasher [c], Andrew Travlos [a,b]

[a] University of British Columbia, Department of Medicine, Division of Physical Medicine and Rehabilitation, British Columbia, Canada
[b] GF Strong Rehab Centre, Vancouver, British Columbia, Canada
[c] Centre for Clinical Epidemiology and Evaluation, Vancouver Coastal Health Research Institute, Vancouver, British Columbia, Canada

Differences in pain in millimeters (standard error) between groups at each follow-up point.

Time point	Difference (SE)	P^*	95% CI
6 Weeks	−5.03 (5.5)	.36	−15.7 to 5.7
3 Months	0.18 (6.9)	.98	−13.3 to 13.7
6 Months	−5.65 (7.0)	.42	−19.3 to 8.0
Analysis of subjects with baseline pain scores ⩾30 mm (BTX-A, n = 16; placebo, n = 14)			
6 Weeks	−2.7 (6.6)	.68	−16.3 to 10.8
3 Months	1.7 (7.7)	.83	−14.2 to 17.6
6 Months	−11.2 (7.1)	.13	−25.8 to 3.4

BTX-A, botulinum toxin type A; CI, confidence interval.
* No *P*-value adjustment has been made to adjust for the multiple testing.

Médicamenteux

Cochrane Library

Cochrane Database of Systematic Reviews

Treatment for thoracic outlet syndrome (Review)

Povlsen B, Hansson T, Povlsen SD

- Cochrane 2014

There is moderate evidence to suggest that treatment with BTX injections yielded no great improvements over placebo injections of saline.

There is no evidence from RCTs for the use of other currently used treatments.

There is a need for an agreed definition for the diagnosis of TOS, especially the disputed form, agreed outcome measures, and high quality randomized trials that compare the outcome of interventions with no treatment and with each other

Médicamenteux

Received: 20 August 2023 | Revised: 20 February 2024 | Accepted: 27 February 2024
DOI: 10.1002/mus.28080

INVITED REVIEW

Answer questions and earn CME https://education.aanem.org/URL/JR115

CME MUSCLE&NERVE WILEY

Botulinum toxin injections for the treatment of neurogenic thoracic outlet syndrome: A systematic review

Tyler T. Woodworth MD[1] | Austin Le MD[1] | Campbell Miller MD[1] | Aaron Conger DO[1] | Mark A. Mahan MD[2] | Daniel M. Cushman MD[1,3]

Botulinum toxin (BTX) injections into the musculature surrounding the brachial plexus have been examined as a potential treatment for neurogenic thoracic outlet syndrome (nTOS). This systematic review identified 15 publications, of which one was a randomized controlled trial. BTX injections performed with ultrasound or electromyographic guidance, and with the inclusion of the pectoralis minor muscle, in addition to the anterior and/or middle scalenes, tended to provide greater symptom improvement and may predict response to first rib resection. Importantly, most studies were of low quality; thus, the results should be interpreted with caution. Further high-quality studies are needed to confirm these findings.

Médicamenteux

- Injection anesthésique

Group	CT	INT	p
Initial Dash	66.93±17.04	60.83±12.58	0.161
Dash Visit III	43.68±16.08	42.40±15.62	0.693
Dash Visit IV	49.90±17.62	35.53±21.37	0.034
Dash Visit V	52.09±22.25	39.17±21.04	0.075

ORIGINAL ARTICLE

Evaluation of the efficacy of ropivacaine injection in the anterior and middle scalene muscles guided by ultrasonography in the treatment of Thoracic Outlet Syndrome

Roberto Rached[1]

Visit I – 1 week before the procedure
- Anamnesis
- Physical examination
- Dash scale
- Wash-out instructions
- Tables of recovery medication and side effects

Visit II – day of the procedure

Visit III – one week after the procedure
- Dash scale

Visit IV – 4 weeks after the procedure
- Dash scale

Visit V – 12 weeks after the procedure
- Dash scale
- Delivery of the tables of recovery medication use and side effects

Recommandation

Current Clinical Concepts: Rehabilitation of Thoracic Outlet Syndrome

Greg Hock, PT, DPT, OCS*; Andrew Johnson, PT, DPT†; Patrick Barber, PT, DPT, SCS‡; Cassidy Papa, PT, DPT, CSCS§

Treatment technique		
Soft tissue mobilization or manual therapy	C	In the case of postural abnormalities associated with soft tissue contracture, soft tissue mobilization can be an effective tool to improve static posture.
Joint mobilizations	C	First rib mobilization, thoracic spine mobilization, cervicothoracic junction mobilization and lateral cervical glides can be effective techniques to improve joint mobility.
Stretching	C	Caution with stretching as TOS is often associated with a traction-based injury and depending on stretching position could irritate symptoms.
Therapeutic exercises	A	Emphasis on middle and lower trapezius combined with serratus anterior to improve scapular control. Starting with short lever arm and a set/repetition scheme, athletes can complete without compensatory patterns.
Blood-flow restriction	C	Blood-flow restriction is not recommended secondary to arterial and venous TOS and potential to progress to upper extremity deep venous thrombosis.
Neural mobilizations	C	Primarily targeting median and ulnar nerves; completed in pain-free manner and when no tensile sensitivity is identified.
Breathing and core stability	C	Intervention to improve diaphragmatic breathing can help decrease hypertrophy of accessory breathing muscles. Progressing strategies to sport-specific activities.
Taping and external support	C	This support can provide short-term management for acute and highly irritable TOS. Helps to facilitate scapular elevation and upward rotation.
Anesthetic injections	B	These injections are used as a short-term symptom relief; often a predictor of who will be successful with a decompression surgery versus as an adjunct to rehabilitation approaches.
Botulinum toxin injections	B	These injections can serve as an adjunct to rehabilitation approaches with short-term results in symptom relief lasting up to 3 months.

Discussion

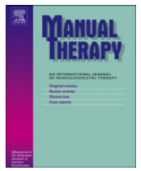
- Critères diagnostiques toujours incertains
- Nombreuses stratégies de traitement rééducatifs fondés sur différentes hypothèses sans éléments de preuve d'efficacité
- Donc attitude pragmatique fondée sur l'anatomie fonctionnelle et la biomécanique en attente de validation

Manual Therapy 15 (2010) 305–314

Contents lists available at ScienceDirect

Manual Therapy

journal homepage: www.elsevier.com/math



Masterclass

Thoracic outlet syndrome Part 2: Conservative management of thoracic outlet

L.A. Watson [a,b], T. Pizzari [b,*], S. Balster [a]

[a] LifeCare Prahran Sports Medicine Centre, 316 Malvern Road, Prahran, VIC 3181, Australia
[b] Musculoskeletal Research Centre, La Trobe University, Bundoora VIC 3086, Australia

Merci

16 mai 2025

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