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Anterior cervical approach with longitudinal awareness of the cervicothoracic spinal micro-anatomy of membranes and layers – Moving away from horizontal, cross-sectional thinking

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Title; Anterior cervical approach with longitudinal awareness of the cervicothoracic spinal micro-anatomy of membranes and layers.

Background: Anterior Cervical Approaches based on not horizontal but longitudinal cross-sectional thinking(Fig.1), a unified method using the anterior border of Sternocleidomastoid muscle as an indicator can safely reach from the upper to cervicothoracic junction vertebrae.

Research question: The membranes and layers are longitudinal continuous. Wouldn't it be better to first reach the layer under Prevertebral fascia, from a level easier to expose, and then follow this layer to reach the target vertebral level?

Design: We retrospectively investigated respiratory complications in patients undergoing surgery using the anterior cervical approach based on a longitudinal sectional perspective.

Methods: Since February 2018, we have examined postoperative respiratory complications in 57 cases of anterior cervical surgery (M/F: 35/22, mean 66.5 y). Number of lesions at cervical vertebral levels were C2/3: 3 cases, C3/4: 15 cases, C4/5: 33 cases, C5/6: 39 cases, C6/7: 23 cases, C7/T1: 3 cases (including: using the manubrium of sternum splitting T1/2/3 OPLL: 1 case(Fig.2)).
Results; All cases were extubated after surgery. Only one case of C4/5/6 ACCF with a history of cervical radiation therapy required reintubation due to postoperative respiratory failure.

Discussion: Alar fascia is continuous longitudinal from Clivus towards the mediastinum, and Alar fascia is a true fascial layer between the retropharyngeal and danger spaces within the deep cervical region(Fig.3,4). Pretracheal and Prevertebral fascia are also longitudinal aligned. After allowing mobility in each layer from the cervical transverse incision site, the layer under Prevertebral fascia (anterior surface of the vertebral body) that is easy to approach is reached(Fig.5). Then from this layer, we can move to the target vertebral level (C2/3 to C7/T1 is possible).

Fig. 1

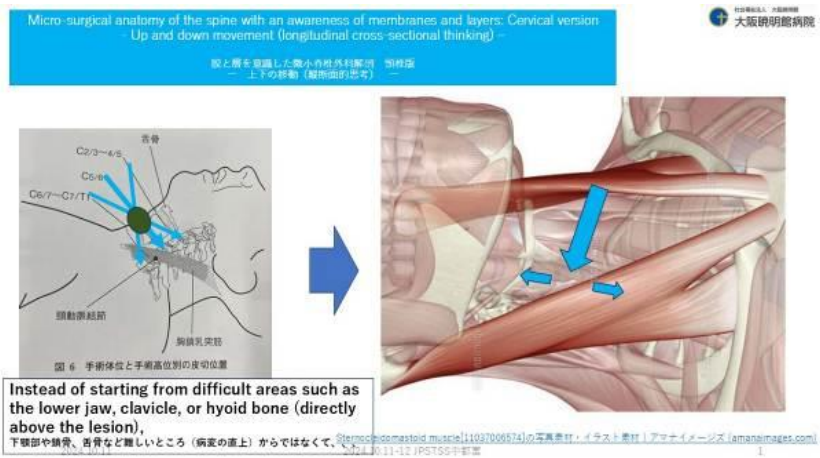
Micro-surgical anatomy of the spine with an awareness of membranes and layers: Cervical version
- Up and down movement (longitudinal cross-sectional thinking) -
大阪脳明館病院
C2/3~4/5
C5/6
C6/7~C7/T1
頭板状筋
胸鎖乳突筋
Instead of starting from difficult areas such as the lower jaw, clavicle, or hyoid bone (directly above the lesion),
下顎部や鎖骨、舌骨など難しいところ（病変の直上）からではなくて、

Fig. 2

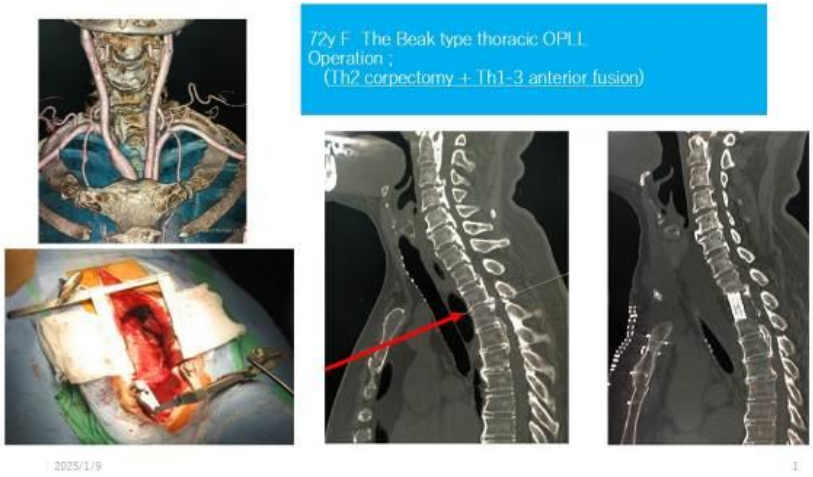
72y F The Beak type thoracic OPLL
Operation ;
(Th2 corpectomy + Th1-3 anterior fusion)

Fig. 3

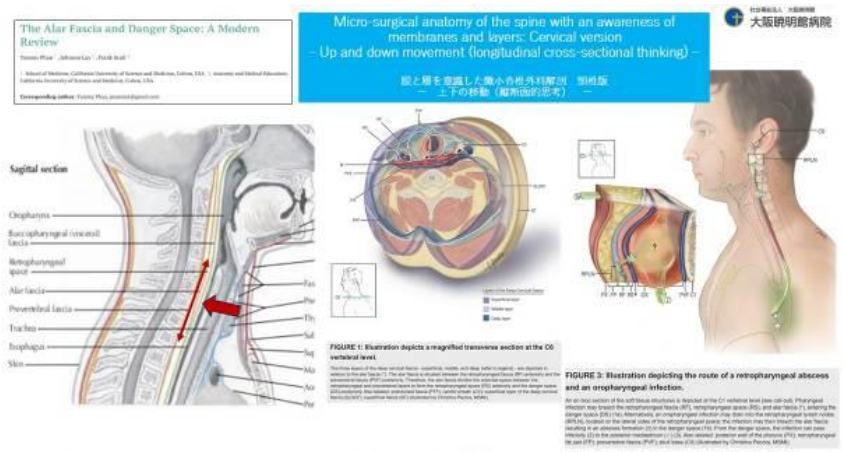
The Alar Fascia and Danger Space: A Modern Review
Micro-surgical anatomy of the spine with an awareness of membranes and layers: Cervical version
– Up and down movement (longitudinal cross-sectional thinking) –
頸と層を意識した微小脊椎外科解剖　頸椎版
– 上下の移動（縦断面的思考） –
大阪明明館病院
Sagittal section
Oropharynx
Buccopharyngeal (visceral) fascia
Retropharyngeal space
Alar fascia
Prevertebral fascia
Trachea
Esophagus
Skin
FIGURE 1: Illustration depicts a magnified transverse section at the C6 vertebral level.
FIGURE 3: Illustration depicting the route of a retropharyngeal abscess and an oropharyngeal infection.
2024.10.11
2024.10.11-12 JPSTSS千葉県
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Fig. 4

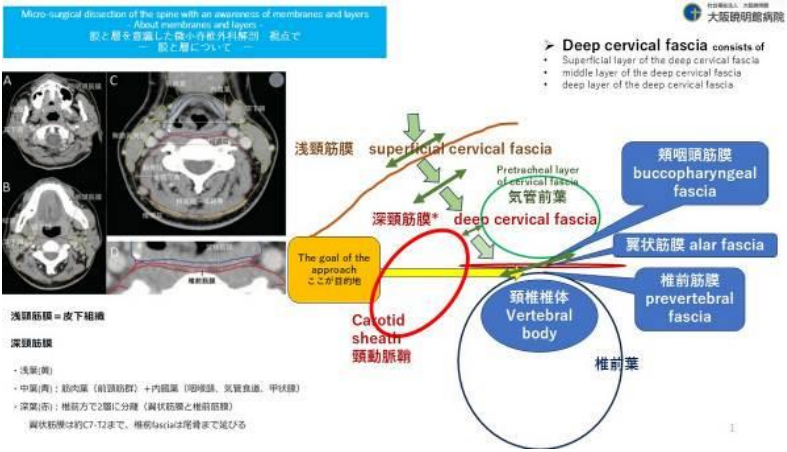
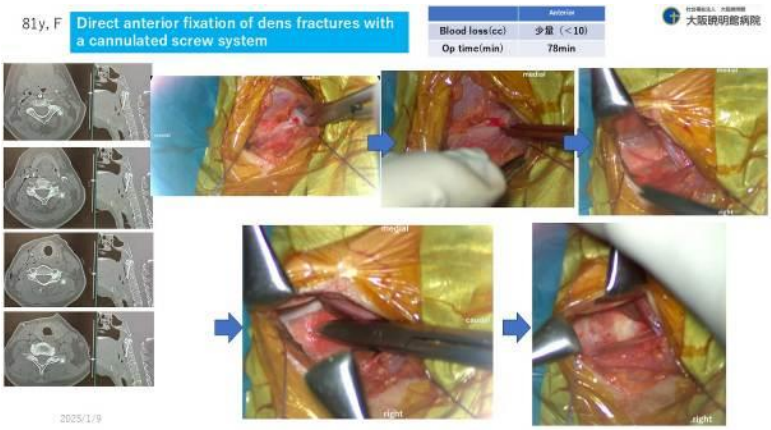

Micro-surgical dissection of the spine with an awareness of membranes and layers
About membranes and layers –
頸と層を意識した微小脊椎外科解剖　視点で
– 頸と層について –
大阪明明館病院
Deep cervical fascia consists of
Superficial layer of the deep cervical fascia
middle layer of the deep cervical fascia
deep layer of the deep cervical fascia
浅頸筋膜 superficial cervical fascia
Pretracheal layer of cervical fascia
気管前葉
深頸筋膜* deep cervical fascia
頬咽頭筋膜 buccopharyngeal fascia
翼状筋膜 alar fascia
椎前筋膜 prevertebral fascia
The goal of the approach
ここが目的地
Carotid sheath
頸動脈鞘
頸椎椎体 Vertebral body
椎前葉
浅頸筋膜＝皮下組織
深頸筋膜
・浅葉(黄)
・中葉(青)：筋肉葉（前頭筋群）＋内臓葉（咽喉頭、気管食道、甲状腺）
・深葉(赤)：椎前方で2層に分離（翼状筋膜と椎前筋膜）
翼状筋膜は約C7-T2まで、椎前fasciaは尾骨まで延びる
1

Fig. 5


81y, F
Direct anterior fixation of dens fractures with a cannulated screw system
Anterior
Blood loss(cc)
少量（＜10）
Op time(min)
78min
大阪明明館病院
medial
right
2025/1/9