Pre-Operative Services Teaching Rounds 1 Jan 2011

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Stony Brook University Medical Center – Home of the best ideas in medicine

- **Rheumatoid Arthritis**
  - Patho-physiology
  - history
  - physical
  - labs
  - medications
- **Shoulder surgery**
  - anesthesia
  - positioning

Case: 55 yr old female for left shoulder arthroscopy/biospy

- PMH:
  - RA since 1989
  - Hypothyroidism
  - DM type 2 for 7 years
- PSH:
  - L shoulder arthroplasty
  - R shoulder arthroscopy
  - Wrist and knee procedures

Case (cont)

- NKDA
- 4 METS –limited by joints
- Normal exam except for joint deformities of the hands and surgical scars.

- Meds: Sulphasalazine, synthroid, insulin and metformin.

Labs

Labs?

- CBC
  - Hb 11.5
  - Hct 34.5
  - MCV 96.9
  - MCH 32.2
  - Plt 225
  - WCC 5.4
- Chem
  - –Na 142
  - –K 4.2
  - –Gluc142
  - –BUN 9
  - –Cr 0.53

- *ECG*
- *βHcg*
- *Xray*
- *ECHO*

RA – pathophysiology

Rheumatoid arthritis is a systemic inflammatory disease

Auto-immune

Causes destruction of synovial joints.

1%

Women 3:1

Pain and disability

Clinical presentation

- Joints – synovial inflammation – synovitis, fluid, destruction of cartilage, ankylosis.
  - Osteopenia
  - Symmetric
  - Early morning stiffness
- Constitutional
  - fever
  - Wt loss
  - malaise

Clinical presentation (cont)

- Musculo-cutaneous
  - Subcutaneous Nodules
  - Vacsulitis
  - Myopathy
    - Myositis
    - Vasculitis
    - drugs

Other systems

- Pulmonary
  - Restrictive – thoracic joints
  - Pul HTN
  - Infections
  - Pleural effusions (serositis)
  - Fibrosis
  - Nodules
  - Drugs

- Cardiovascular – higher mobidity than general population
  - Atherosclerosis
  - PVD
  - Stroke
  - Pericardial effusion
  - Fibrosis
    - conduction
    - LV stiffness
  - Vasculitis
  - Valvulopathy (AI)
  - Amyloid

Other systems

- Renal
  - Vasculitis
  - Drugs
  - Amyloid
- Hematological
  - Anemia
  - Neutropenia
  - High platelets
  - Many others
- Liver
- Ocular
  - Dry eyes
- Neurological
  - Peripheral neuropathy
    - vasculitis
  - Nerve entrapment
    - E.g carpal tunnel
  - Cord injury
- Lymphoma

Treatment options

- Exercise
- Nutrition – Calcium, Vit D, Fish Oil
- Risk reduction – weight/lipid/smoking
- Vaccination
- Physical / Occupational therapy
- Analgesia
- Anti- inflammatory
  - Local
  - Systemic
- Disease modifying
- Surgery

Medications

- NSAIDs
- Glucocorticoid
- Gold (kidney/liver/skin side effects)
- Penicillamine
- Azathioprine (imuran)– inhibits mitosis and coenzyme formation
- DMARDs – biologic and non biologic
  - Alone or in combination with other DMARD or glucocorticoid.

DMARDs

(disease modifying antirheumatic drugs)

1)Antimalarial

2)Sulphasalazine

3)TNF inhibitors: (infection risk/pregnancy)

- Adadlimumab(humira) – IgG monoclonal antibody
- Etanercept(enbrel)
- Infliximab (remicade) - monoclonal antibody

4)Methotrexate – purine metabolism

(c/I liver disease and pregancy)

5)Leflunomide (arava) – pyrimidine synth pathway

Perioperative management of rheumatologic agents

Name or class of drug	Clinical considerations	Recommended strategy for surgery with brief NPO state	Recommended strategy for surgery with prolonged NPO state
Nonsteroidal antiinflammatory drugs	Continuation may cause perioperative hemorrhage.	Hold for 3 days prior to surgery.	Resume with oral intake.
Methotrexate	Potential risk of bone marrow suppression	Continue therapy up to and including day of surgery. In patients with renal insufficiency, hold two weeks prior to surgery.	Continue therapy up to and including day of surgery. Resume with oral intake.
Sulfasalazine and azathioprine	Potential risk of bone marrow suppression	Hold for one week prior to surgery.	Hold for one week prior to surgery and resume with oral intake.
Leflunomide	Potential risk of bone marrow suppression	Hold for two weeks prior to surgery	Hold for two weeks prior to surgery and resume with oral intake
Hydroxychloroqine	Low risk of side effects	Continue therapy up to and including day of surgery.	Continue therapy up to and including day of surgery. Resume with oral intake.
Biologic response modifiers (etanercept, infliximab, anakinra, rituximab, adalimumab)	Risk of infection	Hold for one to two weeks prior to surgery and resume one to two weeks after surgery.	Hold for one to two weeks prior to surgery and resume one to two weeks after surgery or with oral intake.

From UpToDate®

Specific to anesthesia

- Airway:
  - C-spine
  - TMJ (mallimpati/locking/clicking)
  - Arytenoids (hoarseness/swallowing/difficult ETT)

- C-spine involvement:
  - Hx - symptoms of myelopathy: bowel/bladder, progressive weakness, incoordination, gait changes, unsteadiness.
  - Cranial nerve and upper root problems: dysphagia, dysphonia, trouble swallowing, pain in occiput

C-spine

- Incidence 15-85%
- More than 50% without clinical features
- RA has synovial joint destruction
  - Also vertebrae, ligaments and discs
- Joints are destroyed, the connection between vertebrae becomes unstable.

2 categories

a)most common: atlantoaxial instability

b)subaxial

- 1)Spondylolisthesis can occur - upper vertebra is able to slide forward on top of the one below.
- 2)'Settling' skull onto C1 – odontoid pressure onto cord/vertebral arteries
- 3) Pannus (granulation tissue in the joint)
- 4) Ankylosis

? C-spine X-Ray

RA:

- Duration
- Severity of disease
  - Chronic medications
  - Joint involvement
- Age of onset

Surgical features:

- Neck position for:
  - Intubation
  - procedure

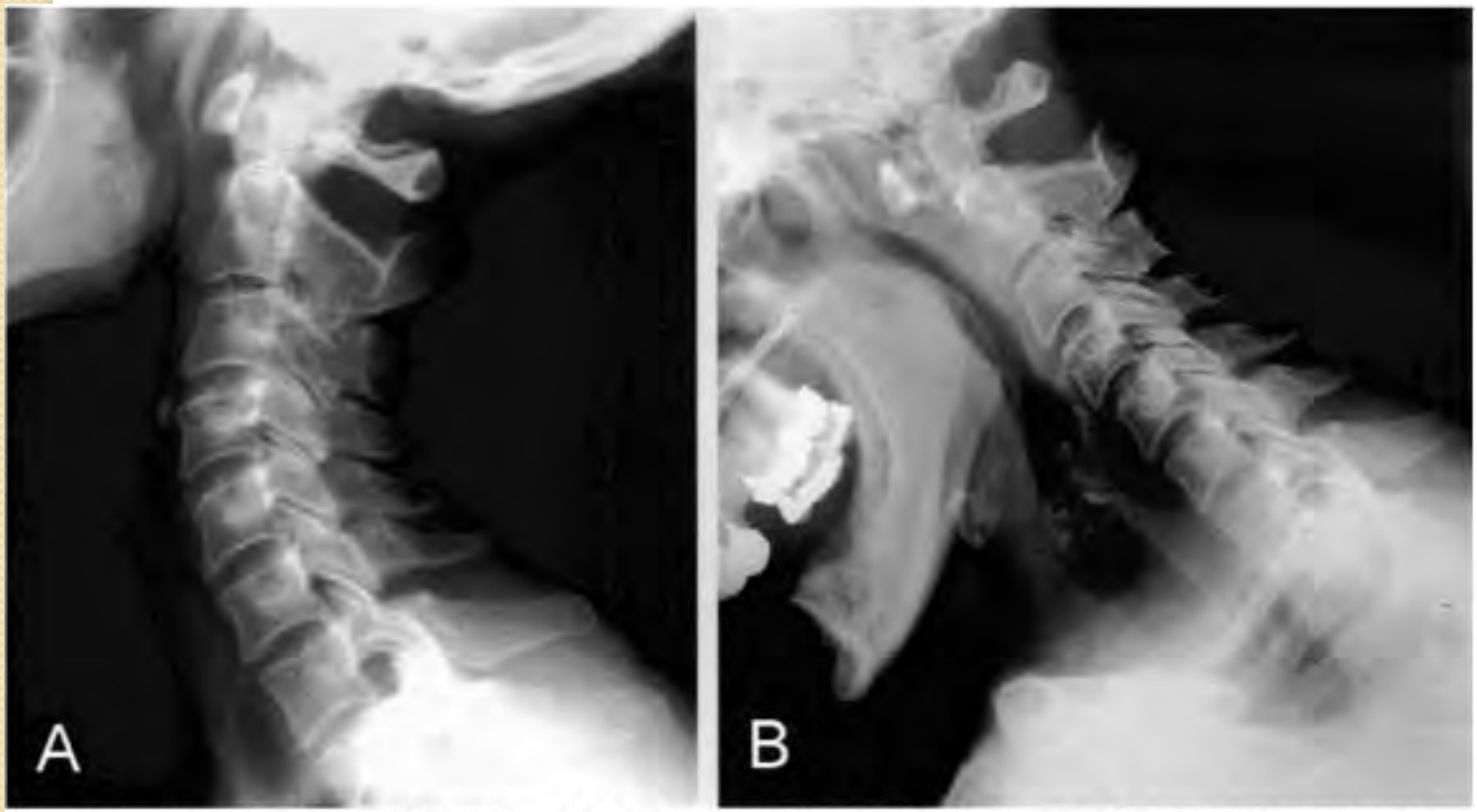


Figure 3 *- Dynamic lateral radiographs of the cervical spine (A- hiperextension; B- hiperflexion), showing atlantoaxial instability*

"A statistically significant correlation was noticed between patients' functional status (Steinbroker's classification) and disease phase (ARA) with the radiographic changes on patients' cervical spines. The presence of radiographic changes on cervical spines of patients with rheumatoid arthritis did not show a statistically significant correlation with nervous pressure-related pain or signs." **Cesar P. Souza[I]; Helton L.A.Defino[II]**
Acta ortop. bras. vol.13 no.1 São Paulo 2005

Shoulder surgery considerations

- Comorbidities
- Ambulatory – biggest at SBUH
- 3 hour surgery - OSA
- Sitting – Blood pressure – Ace inhibitors
- Fluids – cardiac failure
- Shoulder sling – weight/immobility

For the patient

- GA usually with intubation

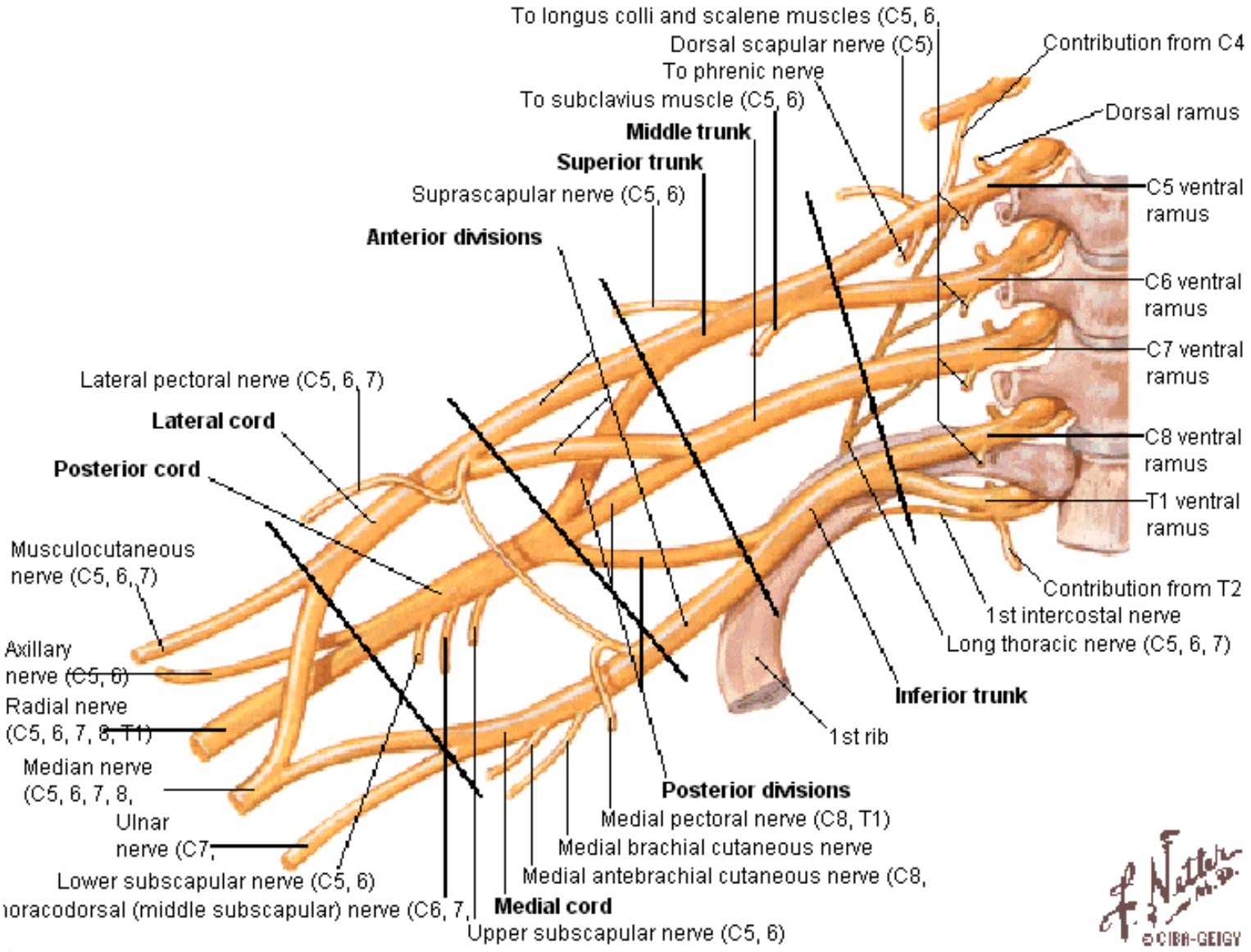
  and/or

- Blocks
  - Infection
  - Hematoma
  - Nerve damage

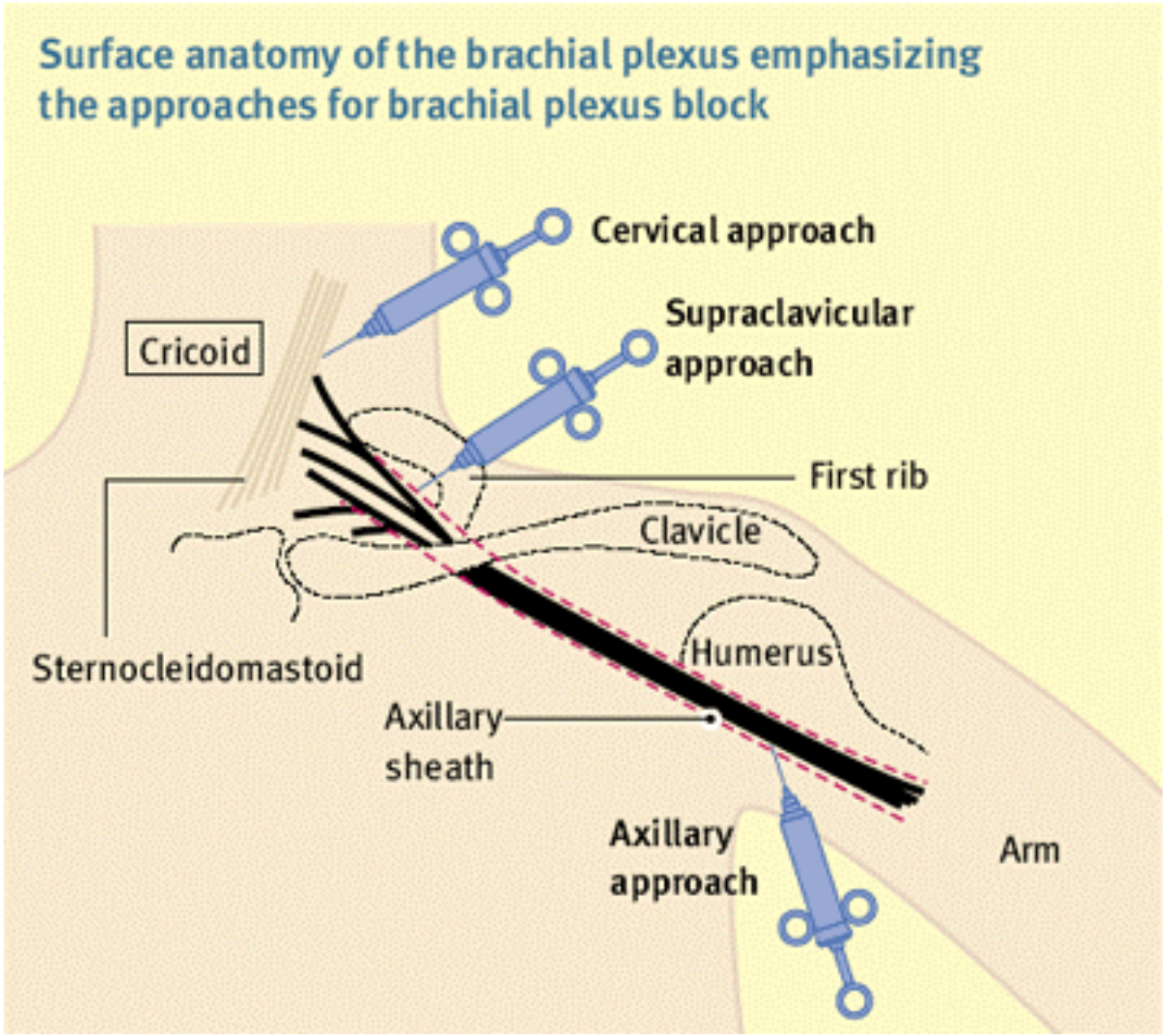
  Specific to **interscalene** :
  - Pneumothorax
  - Horner's syndrome
  - Phrenic nerve
  - Recurrent laryngeal – (hoarseness)

Brachial Plexus

Schema



Surface anatomy of the brachial plexus emphasizing the approaches for brachial plexus block

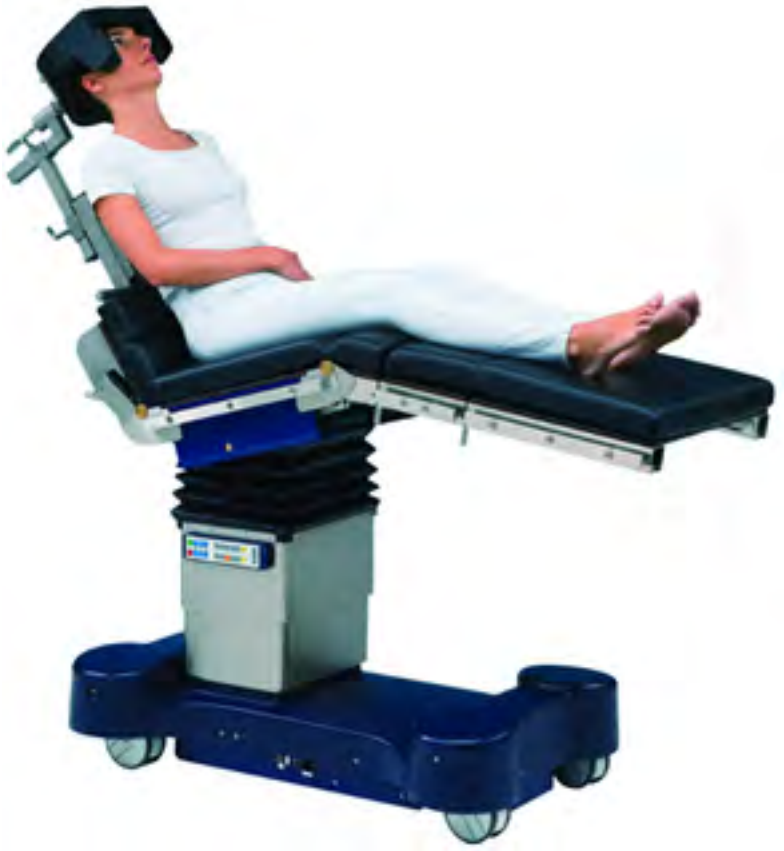


Block technique

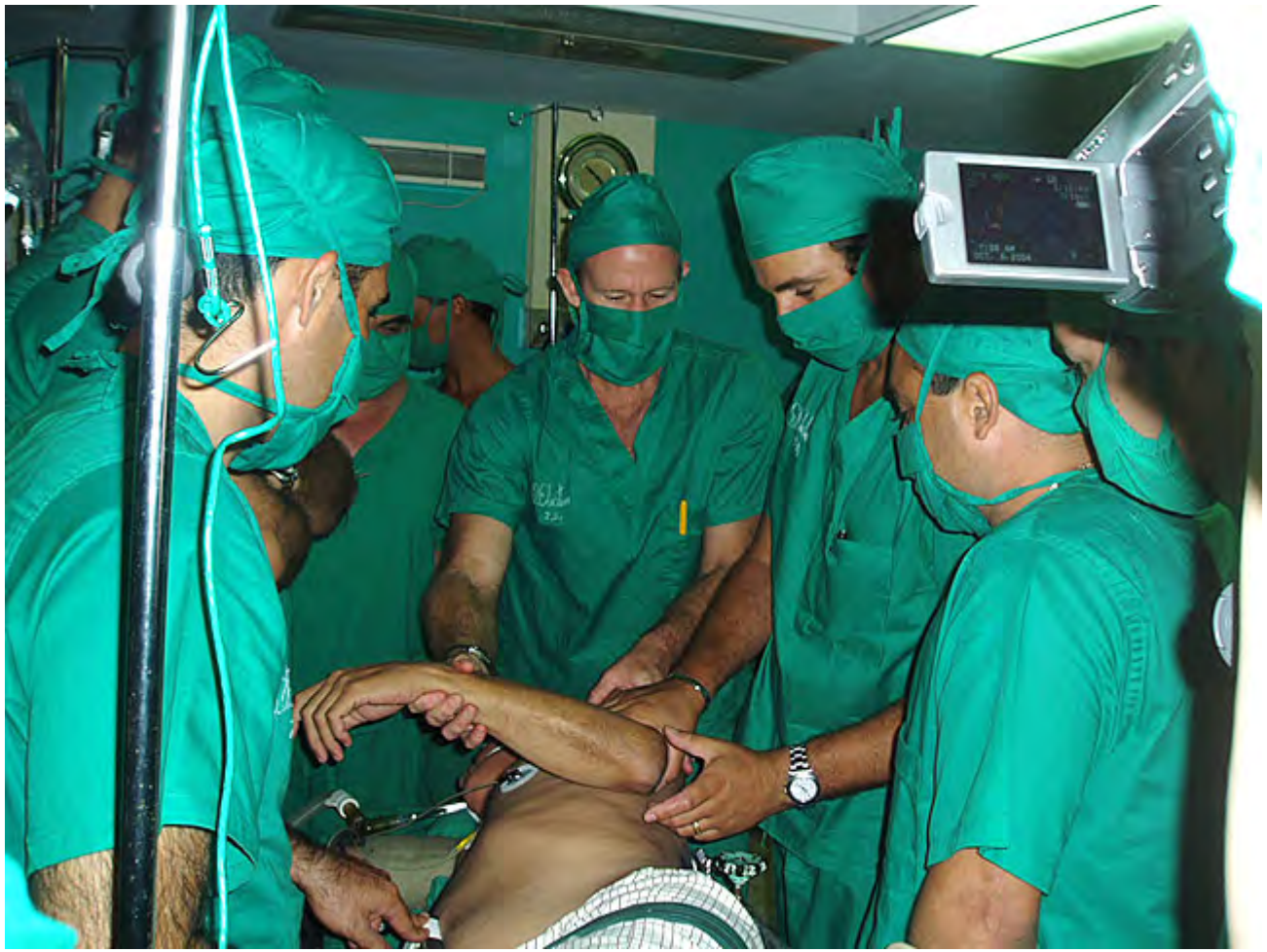
- Monitoring
- Sedation
- Positioning
- Landmarks
- Nerve stimulator
- Ultrasound

(Protect the anesthetized arm)

Beach chair position

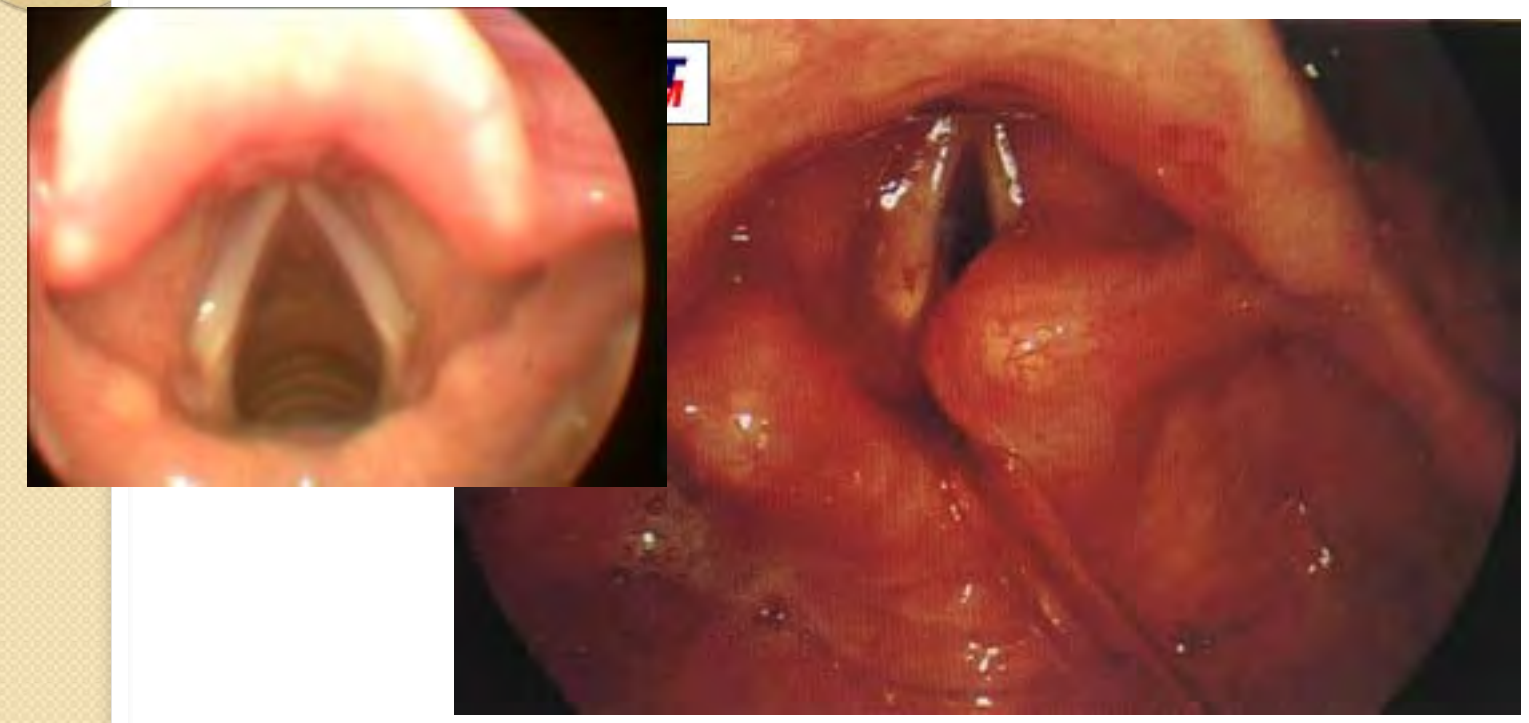


Lateral position



Fiber-optic intubation

Arytenoid cartilage



Summary

- Not enough to write RA on chart
  - Duration
  - Extent of disease
  - Organ involvement
  - Medications
  - Airway
- Shoulder surgery
  - Ga +/- Block
  - positioning