

# Patient positioning-related complications and Hypotension-induced complications in spine surgery

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## Introduction

Patient positioning is an integral part of the surgery  
Surgeon and Anesthesiologist share the responsibility  
Compromise between the surgery and the respect of the patient's vital functions

A poor positioning can induce

- A complicated surgery due to bad patient positioning
- An increased duration of surgery
- Complications to the patient (transitory or definitive)

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## Cardio-Respiratory complications

**Respiratory complications:**

- Abdomen and Thorax compression decrease total lung compliance and increase work of breathing
- Prevention: support should be placed on upper thorax and iliac crest or longitudinally from clavícula and iliac crest
- Positioning must avoid thorax compression

**Cardiac complications:**

- Compression of abdomen (and of the inferior vena cava) : hemodynamic instability
  - Genu pectoral position: abdomen free of compression
- Pooling of blood in extremities: up to 700ml of blood
  - Decreases preload, cardiac output and blood pressure → severe hypotension that can be treated by IV fluids.
- GA decreases physiologic compensations of postural disorders. Collapse may occur because of blood pooling
- Slow and progressive mobilisation, avoid thorax and abdomen compression

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## Ocular complications

**Corneal abrasion**

- 34-61% postoperative ophthalmic complication of non ophthalmic surgery
- Direct trauma (20%) or eyes not closed during surgery (up to 80%)
- Head mobilisation during surgery
- Painful +++

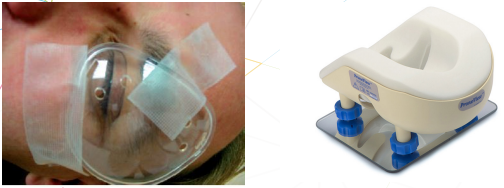
**Retinal ischemia**

- Direct ocular compression, worsened by (severe) hypotension
- Irreversible unilateral blindness

**Ischemic optical neuropathy**

- Optical nerve infarction, bilateral
- Intraocular hypertension
- Multiple risk factors: prone position, Surgery > 6h, blood loss > 1l, perioperative hypotension, patient comorbidities (diabetes, obesity, vascular patients)
- Careful positioning and multiple perioperative checks

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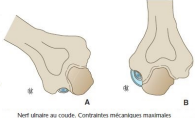
## Neurological complications (1)

**Peripheral neuropathy:**

- due to stretching (nerve is between 2 distant fixed points) or compression (contact nerve / bone) :
- decreased blood flow in the vasa nervorum. Ischemia can induce neuropathy after 30 min,
- Paresis to paralysis
- Combined factors: patient comorbidities, perioperative hypotension, hypothermia, NMB

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## Neurological complications (2)

- Brachial plexus: stretching + direct compression, !! GA
 
- Ulnar nerve: 30%, due to pronation, Flexion > 90°
 

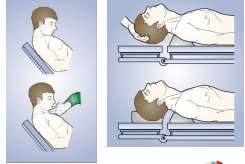
Nerf ulnaire au coude. Contraintes mécaniques maximales quand l'avant-bras est en pronation (A). Absence d'appui sur le nerf ulnaire quand l'avant-bras est en supination (B).

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## Neurological complications (3)

### Central neuropathy

- Cervical arteries compression (direct or due to neck hyperextension/flexion)
- Misregulation cerebral blood flow
- Medullar compression
- (Veinous compression)



→ Assess neck mobility before GA  
→ Avoid anemia and hypotension

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## Cutaneomucous complications

- Bony prominences at risk
  - Iliac crest, Knee, Toes
  - Shoulders
- Declive zones
- Mammal compression or genital compression
- Due to increased tissular pression (pression > capillar pression of 35 mmHg), favored by hemodynamic instability, anemia, edema, patient status
- Erythematous and Painful lesions

→ Body weight repartition on the largest surface possible, padding over bony prominence, decrease surgery duration

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## Conclusion

Patient positioning is part of the surgery !

- Lots of positioning complications, Varied
- Important to know which complication may occur regarding to the position
- Patient at risk
- Surgeon and anesthesiologist collaboration to double check position
- Peroperative checking
- Hypotension : aggravating factor

Even if position is correct, complications may occur.

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**Thank you !**

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**KEEP CALM  
AND  
BLAME  
ANESTHESIA**

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