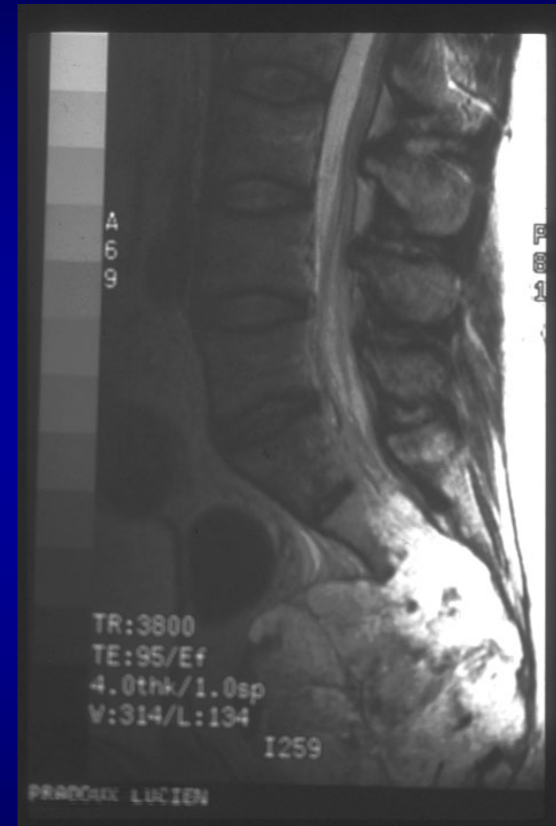
Strategy for surgical treatment of primary bone tumors of the spine

Dr S.LUC, Pr O.GILLE



A System of Staging
Musculoskeletal Neoplasms

Surgical Staging System
SSS

Clin Orthop, Enneking 1980

3 factors

Grade

Grade 0 : benign tumor
Grade 1 : low malignant tumor
Grade 2 : high malignant tumor

Topography

TO: tumor delimited with a capsule
T1: intracompartimental tumor
T2: extracompartimental tumor

Metastasis

M0: no metastasis
M1: metastasis

Benign tumors

STADE	1 (inactive)	2 (active)	3 (agressive)
Degré	GO	GO	GO
Situation Anatomique	TO	TO	T1-2
Métastases	MO	MO	MO -1
Évolution Clinique	asymptomatique, ne croit pas, tend à réparer spontanément	symptomatique, croit, s'étend aux tissus avoisinants	agressive, envahit les tissus avoisinants
Grade RX	1	2	3
Scintigraphie	négative	positive dans la lésion	positive au-delà des contours de la lésion
Angiographie	aucune réaction néovasculaire	modeste réaction néovasculaire	importante réaction néovasculaire
Scanner	bords nets, capsule épaisse, homogénéité	bords nets mais élargis, capsule mince, homogénéité	bords flous, pas de capsule, inhomogénéité

Malignant tumors

STADE	IA	IB	IIA	IIB	IIIA/IIIB
Grade	G1	G1	G2	G2	G1-2 G1-2
Situation anat.	T1	T2	T1	T2	T1 T2
Métastases	M0	M0	M0	M0	M1 M1
Évolution clinique	lente	lente	rapide	rapide	-
Scintigraphie	positive	positive	positive au delà des limites RX	positive au delà des limites RX	-
Grade RX	1	2	3	3	2 3
Angiographie	modeste réaction néovasculaire péritumorale	modeste réaction néovasculaire péritumorale	nette réaction néovasculaire péritumorale	nette réaction néovasculaire péritumorale	ganglions l ymphatiques hypervasculaires
Scanner/IRM	bords flous mais intracom-partiment	origine ou exp. extracom partiment	bords flous mais intracom-partiment	origine ou exp. Extracom-partiment	métastases (pulmo, osseuses, lymphat, etc.)

I : FAIBLE MALIGNITÉ A : INTRACOMPARTIMENTALE

II : FORTE MALIGNITÉ B : EXTRACOMPARTIMENTALE

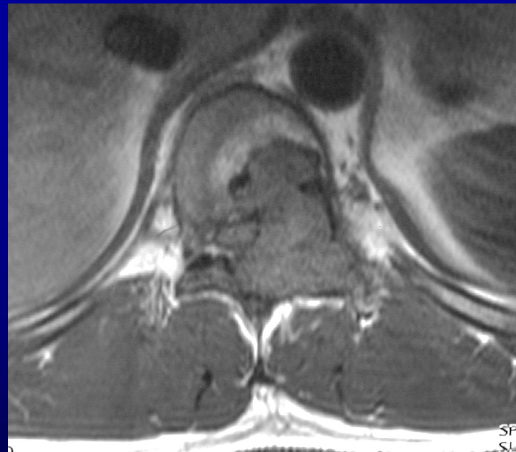
Definition of surgical margins

Intralesional :	piecemeal removal
Marginal :	extracapsular in reactive zone resection
Wide :	safe margins
Radical :	extracompartimental resection

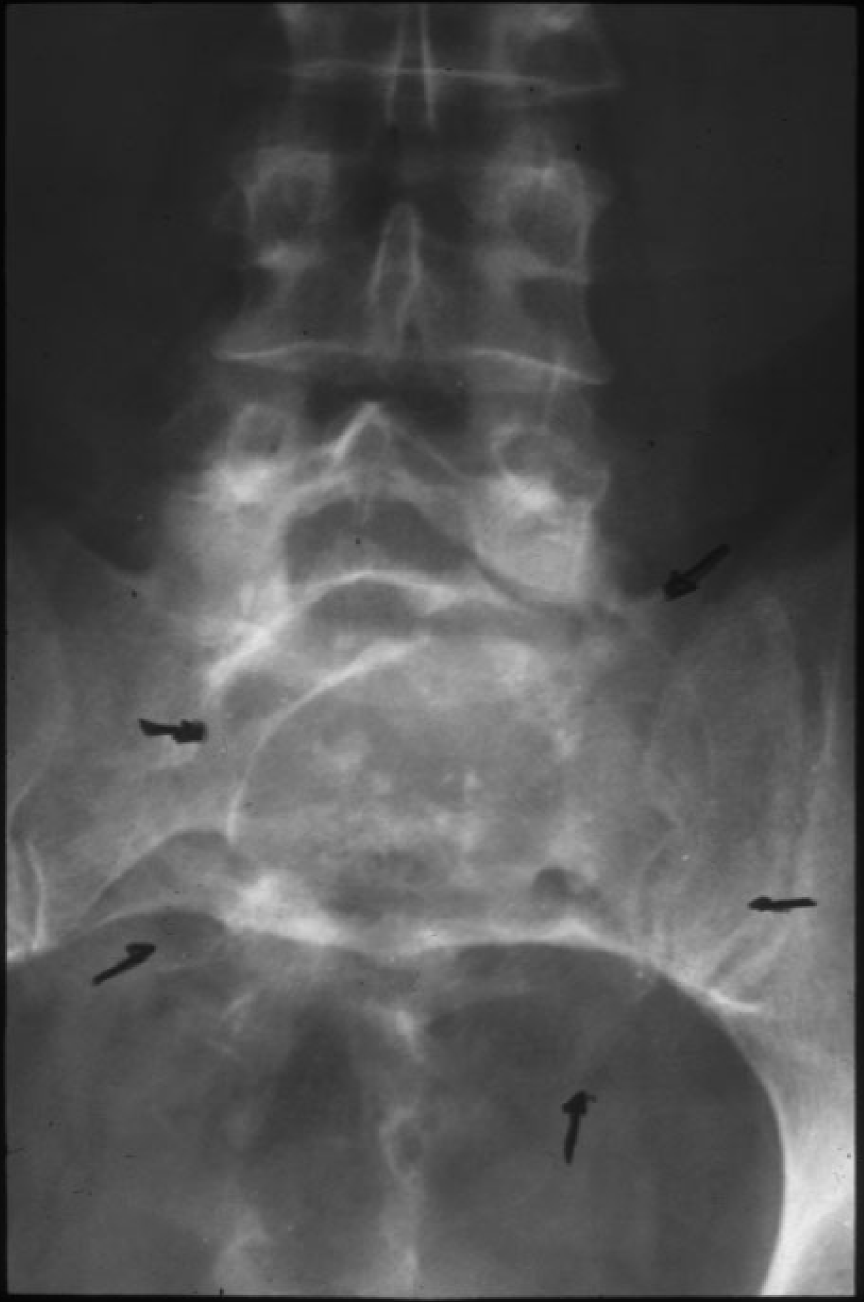
4 rules specific to spinal surgery

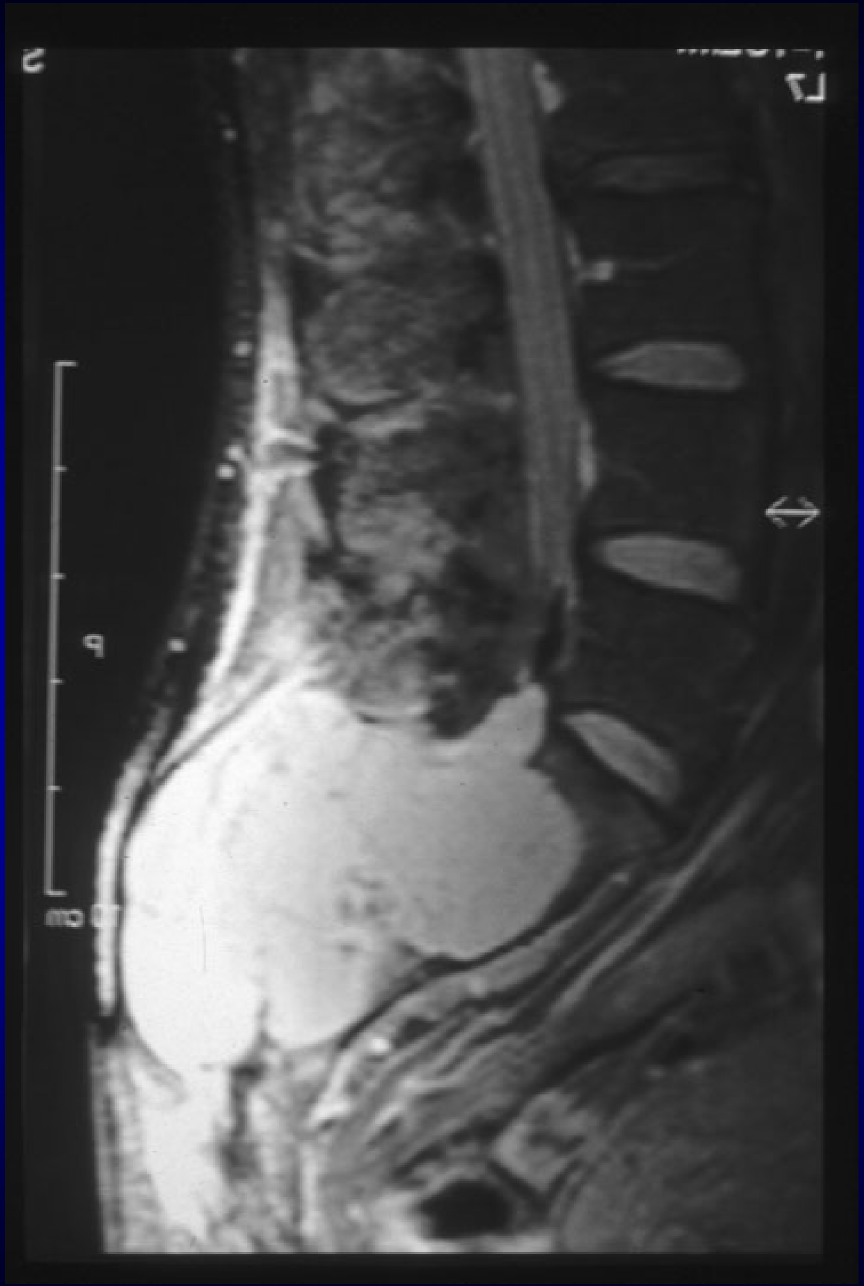
1) Spinal cord must be protected as much as possible

2) The spinal cord cannot be resected « en bloc » with the tumor

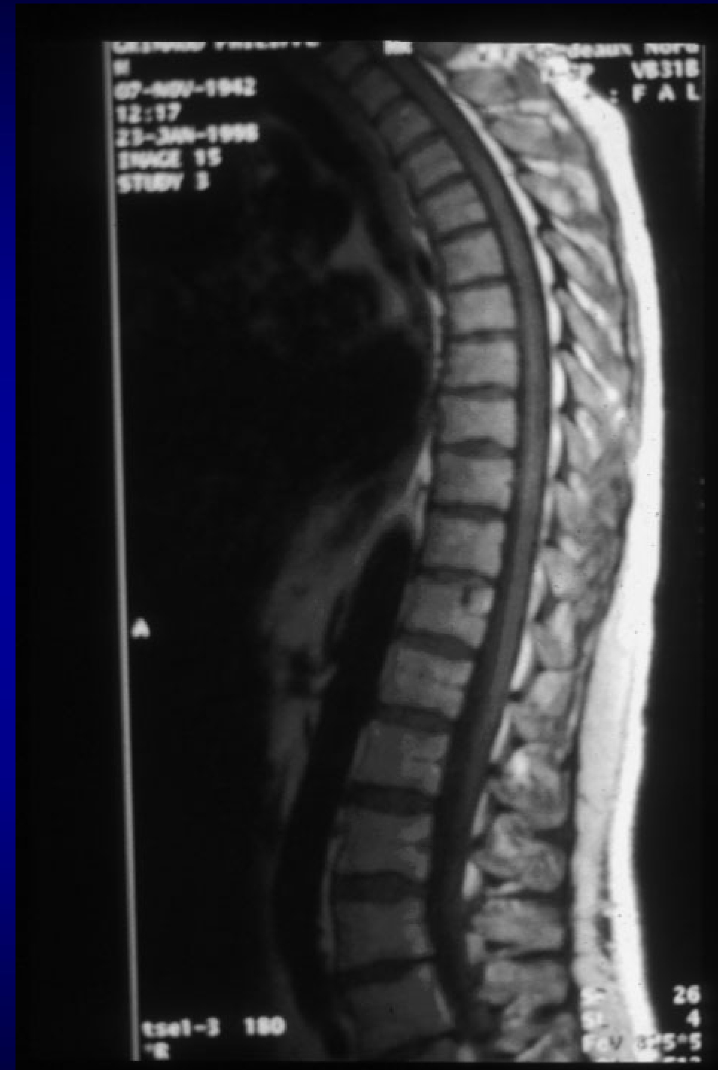


→ *« en bloc » Vertebral resection is impossible*



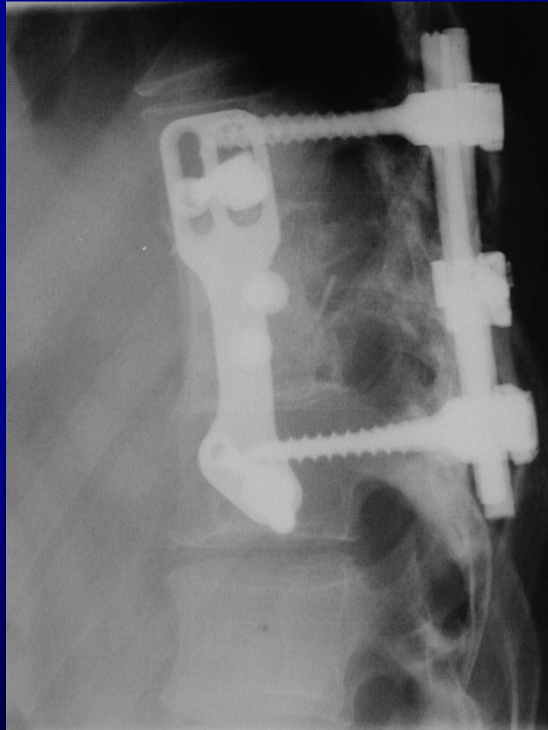


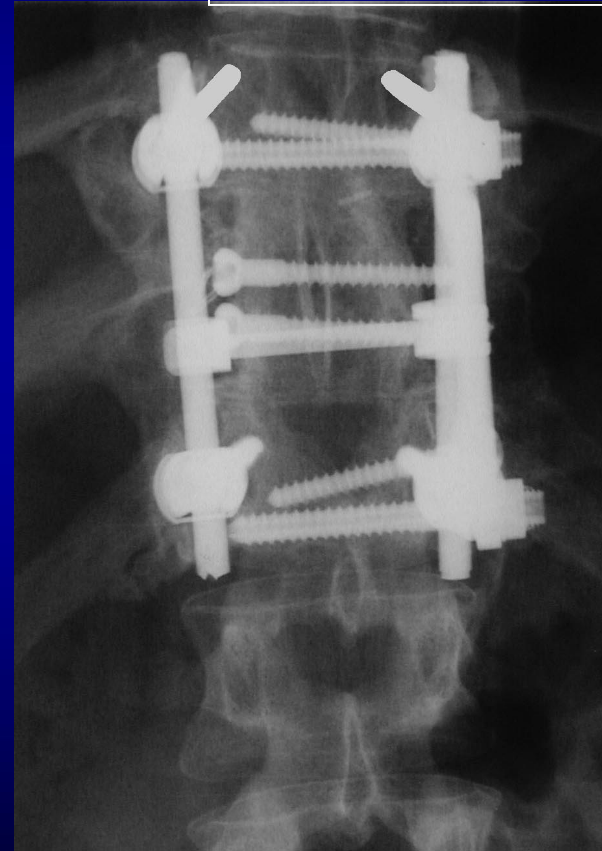
3) There is no anatomical compartment limitation of the spinal canal



4) Spinal stability must be preserved

- During surgery
- After surgery
- In the future



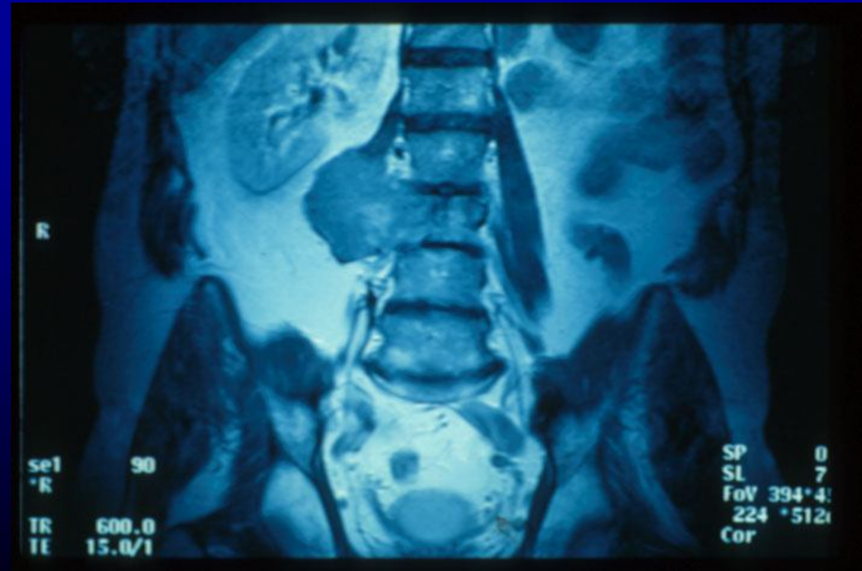


Therapeutic strategy begins during the diagnostic phase

- Clinical examination
- Plain films
- CT scan
- MRI

Goals

- Give an idea of the pathological diagnosis
- Obtain a 3D picture of the tumor



3 different situations

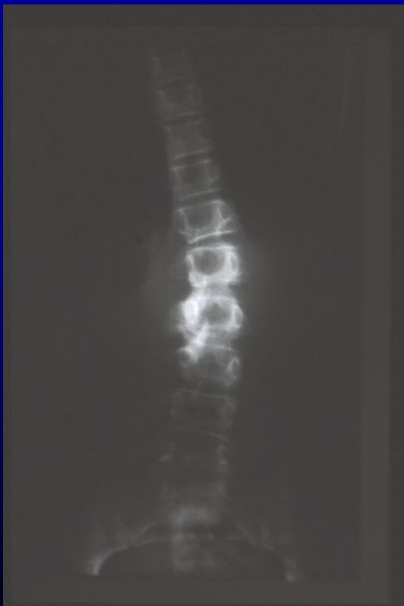
First situation

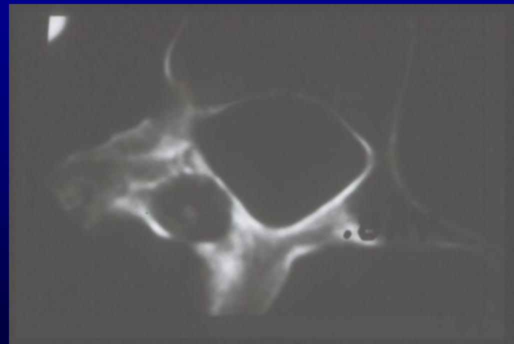
Probable benign lesion

Either surgical treatment alone

(intralesionnel resection)

Either no treatment

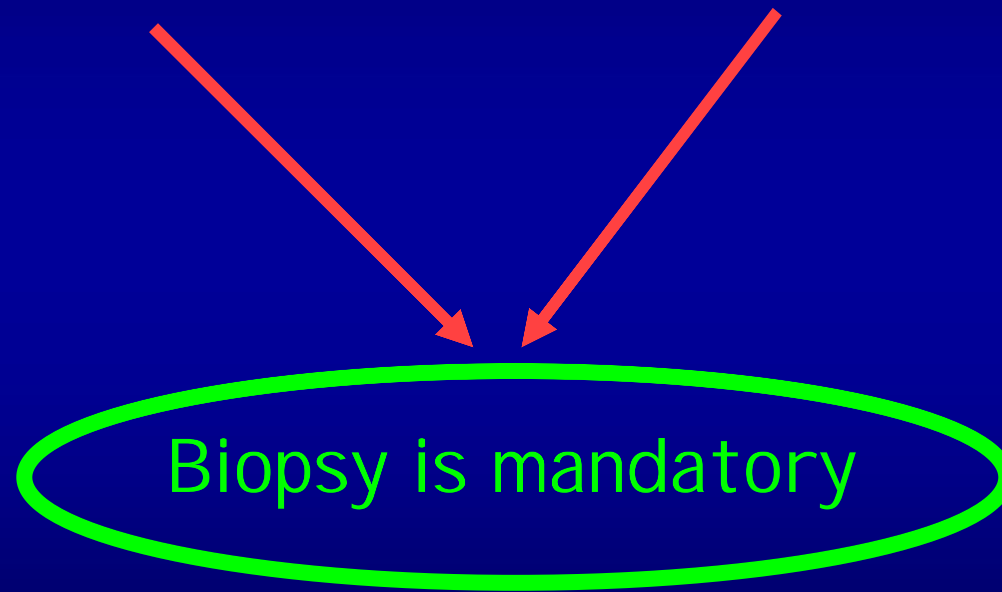




Second situation

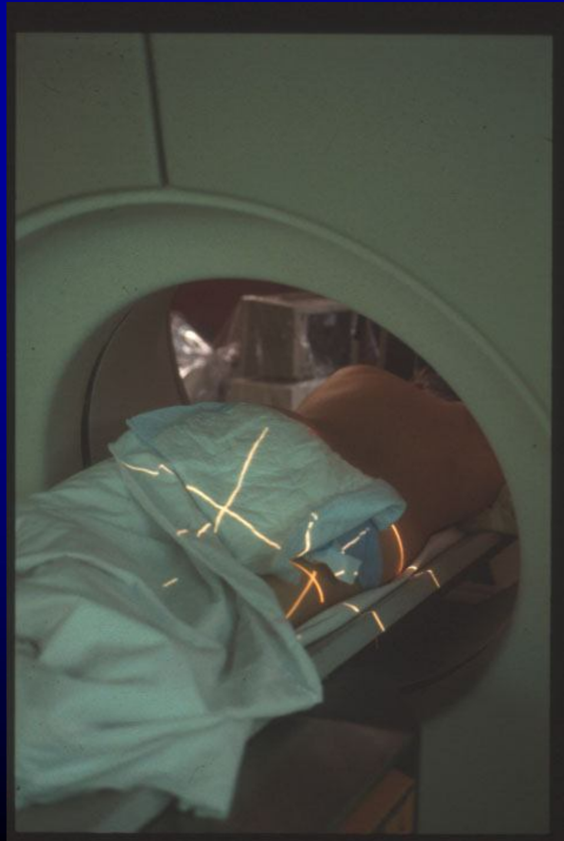
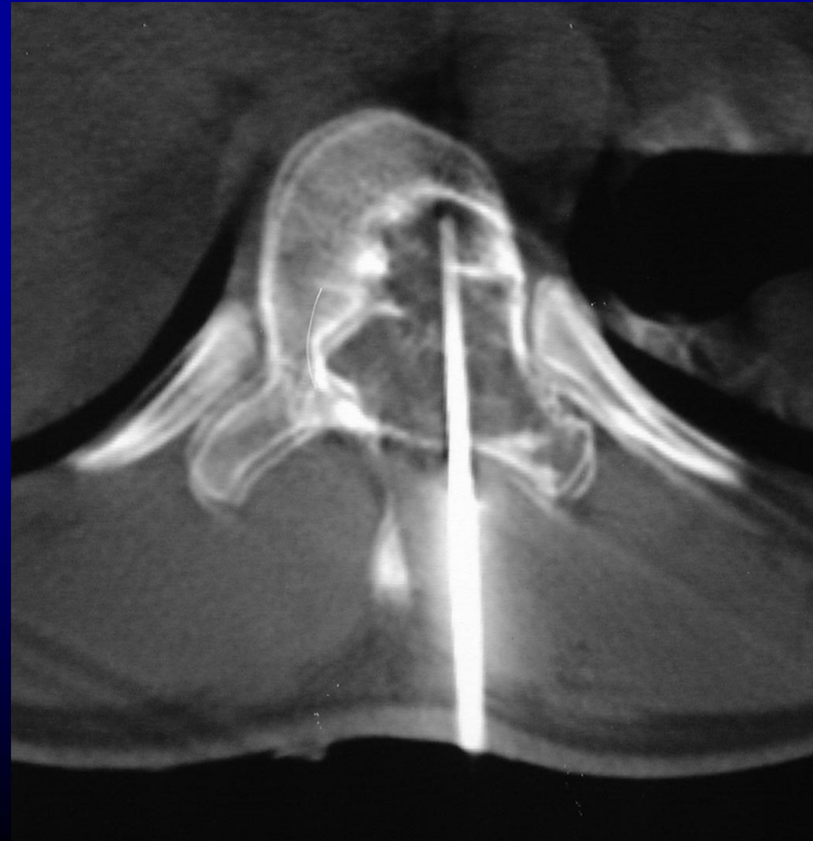
Probable malignant lesion

Doubt about the benigness of the lesion



Biopsy

- Surgical
- Transcutaneous, positive in 80% of cases

Third situation

Neurological disorders

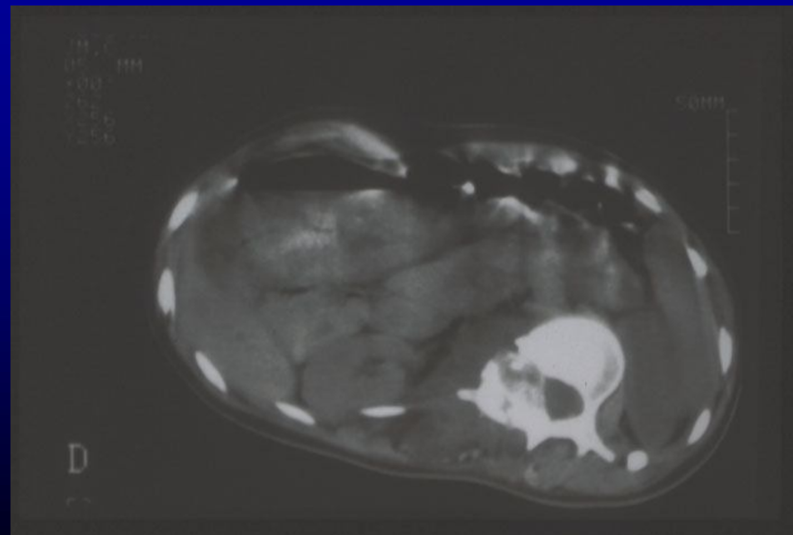
Emergent minimal surgical decompression,
with biopsy

Results of biopsy

benign lesion

surgical treatment alone

(marginal resection)



Results of biopsy

Malignant lesion

First chemotherapy

Surgery must be done in a second time

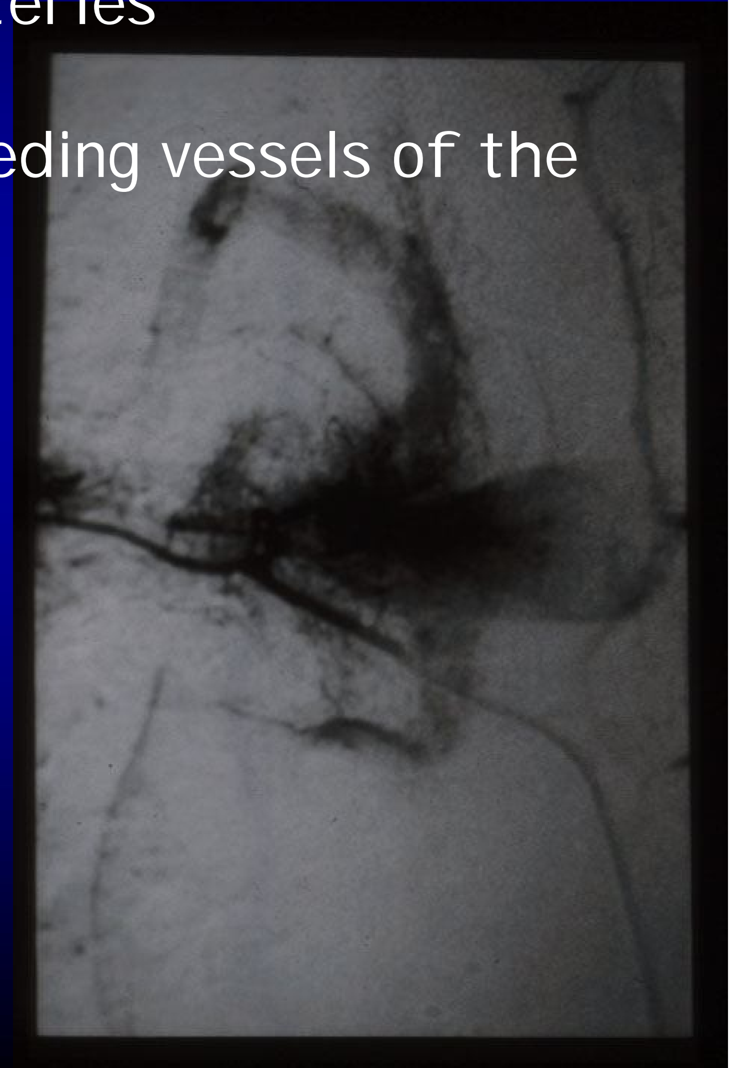
Utility of first chemotherapy

- Control micrometastasis
- Reduce the tumoral volume
- Make easier the later surgery

Operative strategy

I. Arteriography

- Determines the level of medullar arteries
- Permits embolization of the main feeding vessels of the tumor



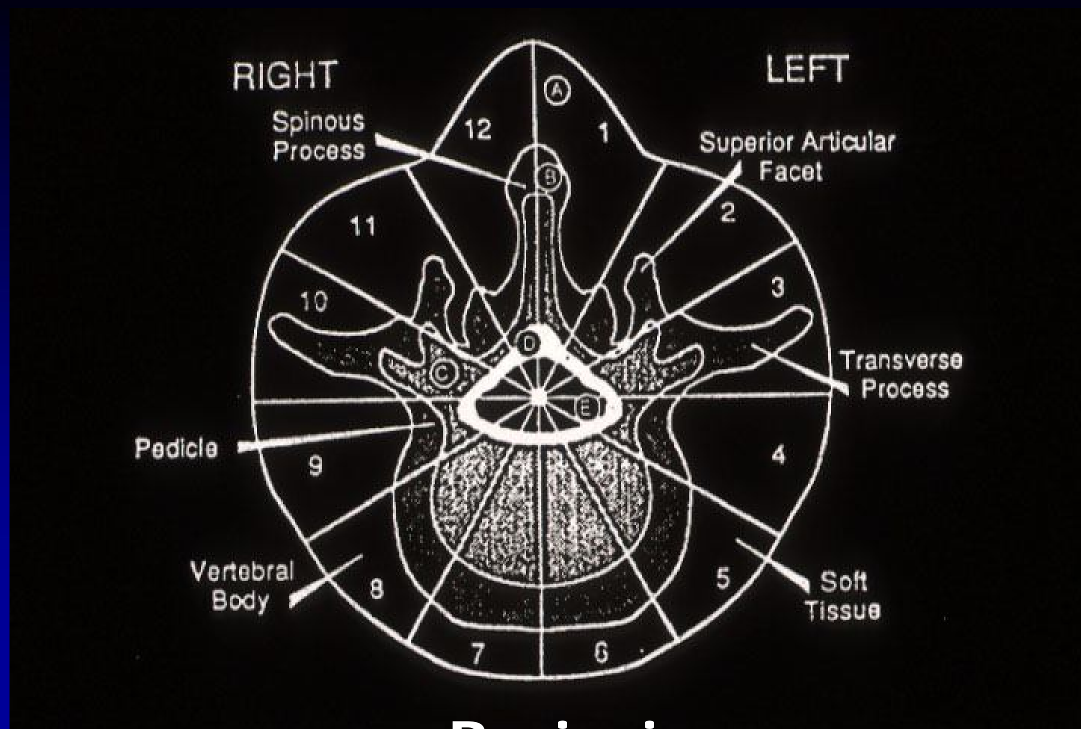
II. Planning the surgical procedure

Which approach ?

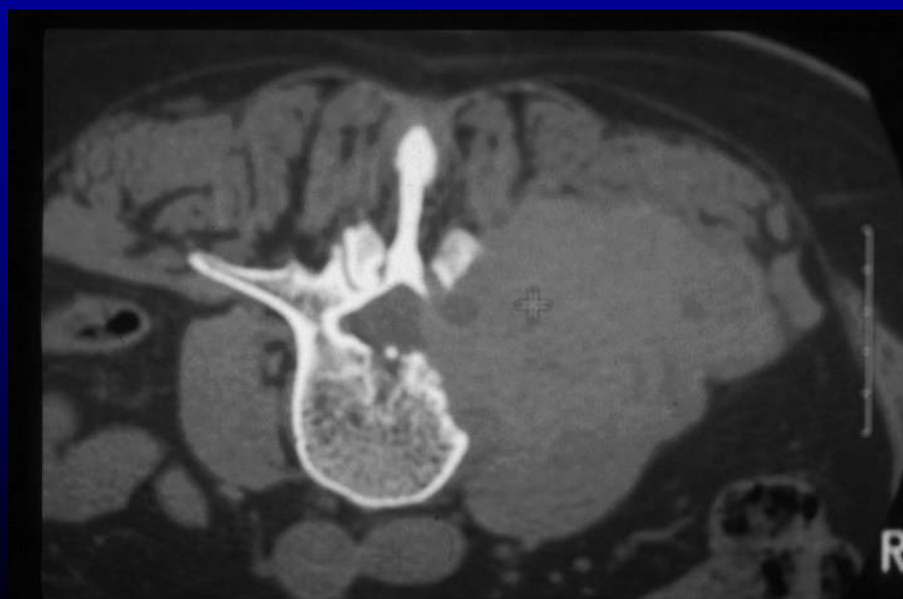
Vertebral body tumor : anterior

Neural arch tumor : posterior

Circumferencial or hemivertebral tumor : combined approach

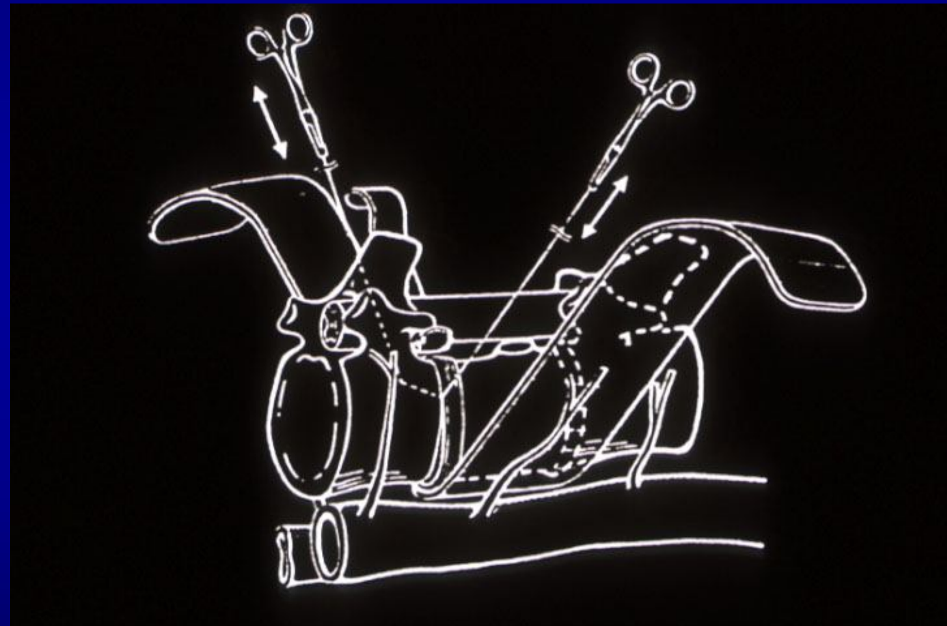


Boriani



Vertebrectomy through a posterior approach

- Stener 1971
- Roy-Camille 1986
- Tomita 1994



Postoperative strategy

Postoperative course of malignant tumor

- Quality of the excision ?

- Response to preoperative chemotherapy ?
  - Histological mapping and grading on the operative resected piece
  - Patient is a good answering if > 95 % of necrosis of tumoral cells

- Radiotherapy ?

Recurrence of begnin lesion

Iterative surgical removal

Recurrence of malignant lesion

Palliative treatment

CONCLUSION

Factors that influence survival in patient with malignant tumors

- Stage of the tumor
- Response to chemotherapy
- Quality of the surgical margins

The first treatment <u>must</u> be the best