

XIX

Curso Nacional de
NEURORRADIOLOGÍA

Radiología Raquimedular

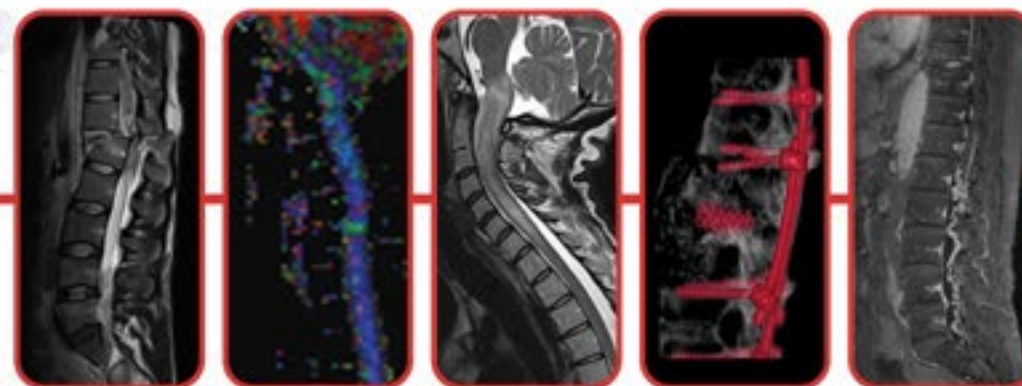
TUMORES ESPINALES

INTRADURALES e INTRAMEDULARES



20 y 21 de abril de 2023 • MADRID
Sede: CINESA. Calle de Fuencarral, 136

Dra. Ibone Saralegui
OSATEK, hospital de Galdakao





ANATOMÍA

DIAGNÓSTICO RADIOLÓGICO

CLASIFICACIÓN TUMORES ESPINALES

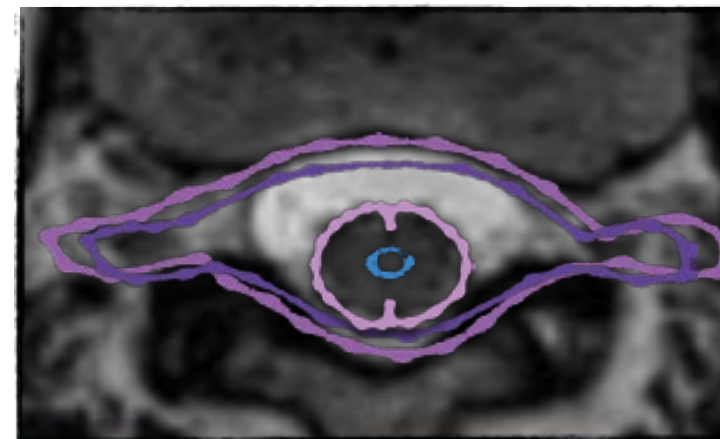
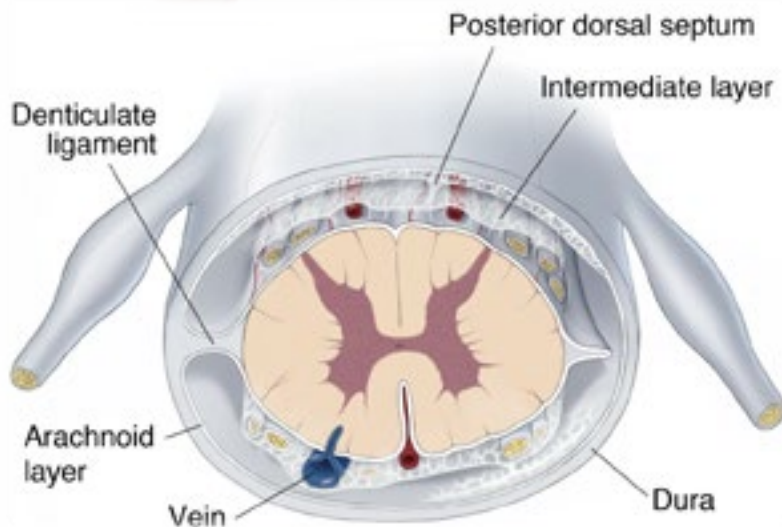
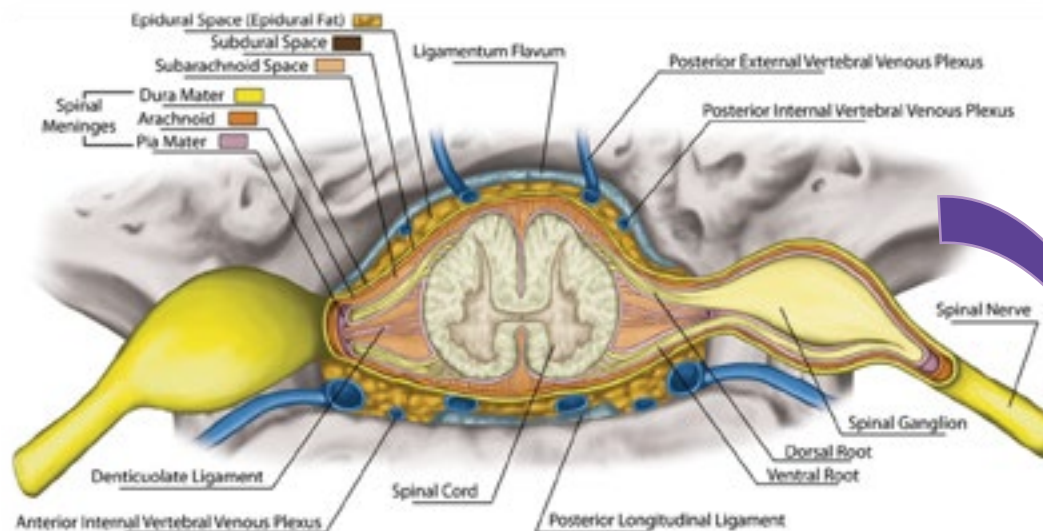
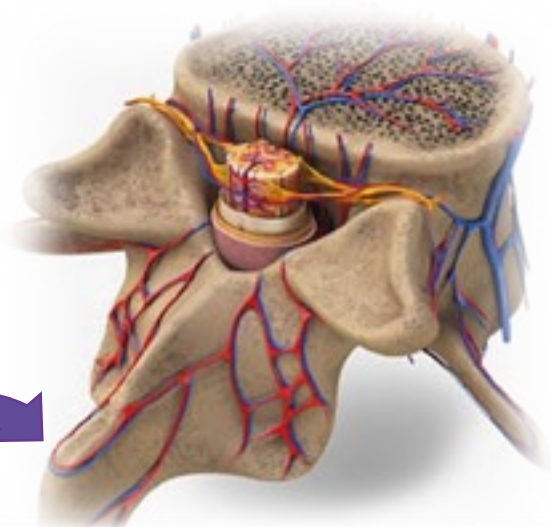
TUMORES INTRAMEDULARES

TUMORES INTRADURALES EXTRAMEDULARES

MASAS CONGÉNICAS / DEL DESARROLLO



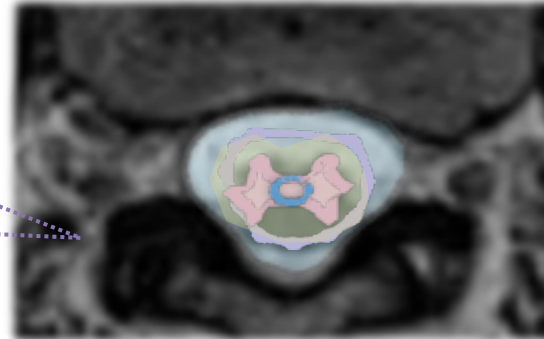
ANATOMÍA



ANATOMÍA

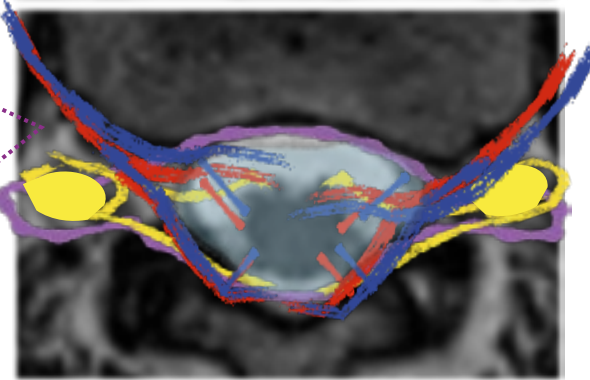
Esp. INTRAMEDULAR

MÉDULA
EPÉNDIMO
LCR



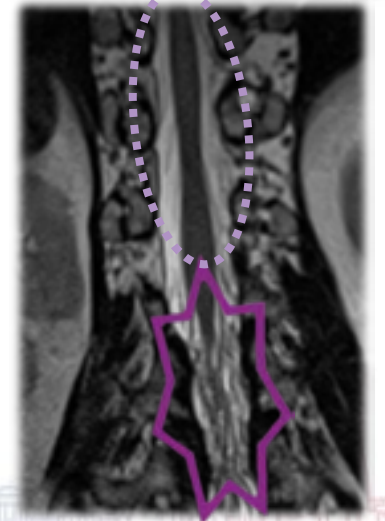
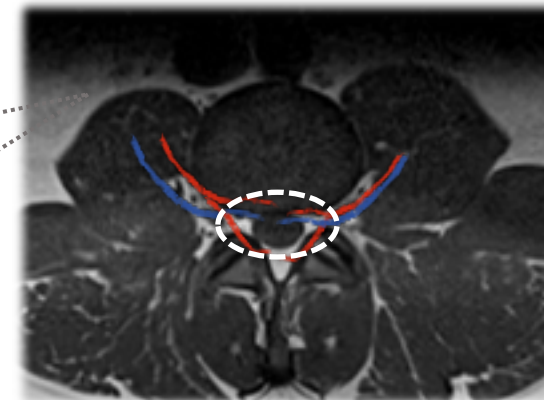
Esp. INTRADURAL-EXTRAMEDULAR

MENIGES
LCR
VASOS
LIGAMENTOS
NERVIOS



Esp. EXTRADURAL

GRASA
VASOS
NERVIOS
HUESOS

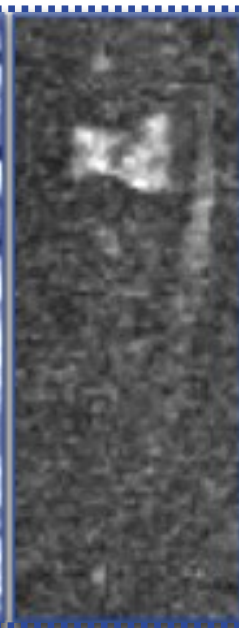
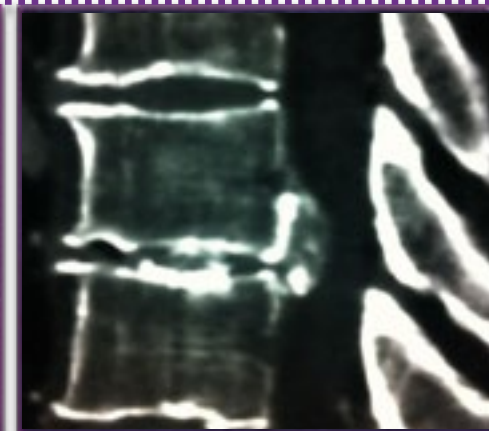


DIAGNÓSTICO RADIOLÓGICO

RX



TC



RM





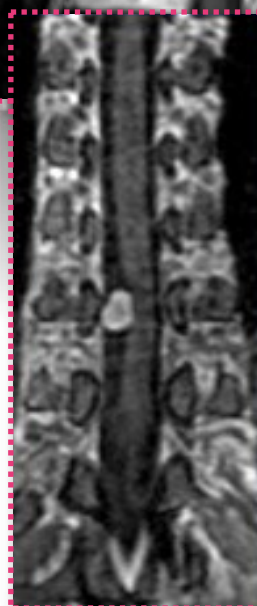
T1

T2

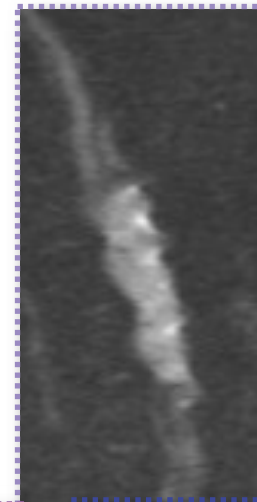


EG

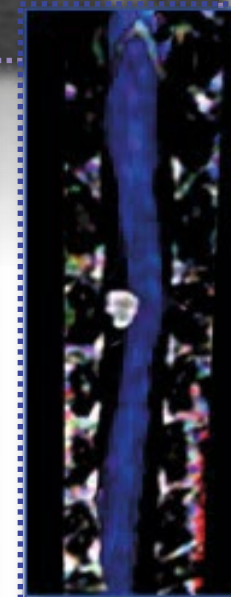
GD



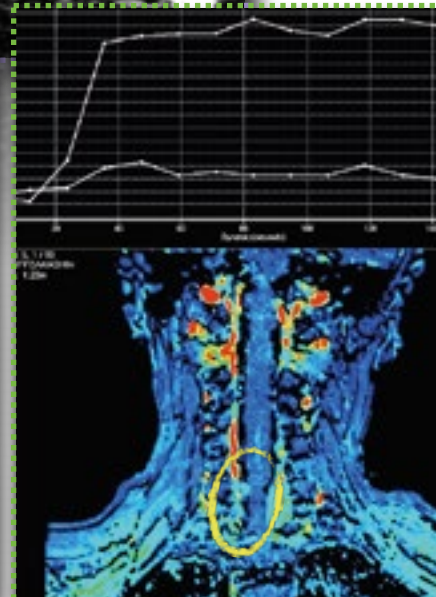
DWI



MIELORM



DTI



DCE MRI

SISTEMÁTICA DIAGNÓSTICA

UBICACIÓN: Intramedular o Intradural-Extramedular

LOCALIZACIÓN: Segmento(s) Espinales afectados

En tumores intramedulares: Ubicación Medular (central vs excéntrica)

TAMAÑO: Extensión tumoral

NÚMERO: Lesiones Únicas vs Múltiples

COMPORTAMIENTO en RM:

Intensidad de la señal en T1, T2, FG,...

Presencia y Patrón de Captación del contraste

Presencia de: Hemorragia, Calcificación, Necrosis, Quistes (tumorales, no tumorales)

Síringomielia, Edema peritumoral, Vacíos de flujo prominentes, Realce leptomeníngeo,...

Anomalías circundantes:

Cambios óseos: Escoliosis, Ensanchamiento del canal espinal, Festoneo cuerpos vertebrales, Agrandamientos foraminales

Compresión de la médula espinal o desplazamiento de las raíces nerviosas,...



CLASIFICACIÓN TUMORES ESPINALES

DIAGNÓSTICO DIFERENCIAL en base a:

Localización de la lesión respecto a médula

Edad, Sexo

Presentación clínica

CLASIFICACIÓN:

Tumores INTRAMEDULARES

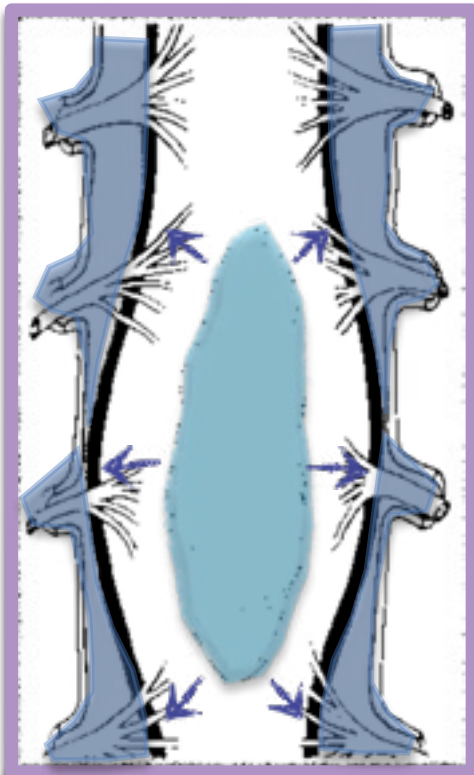
Tumores INTRADURALES-EXTRAMEDULARES

Tumores EXTRADURALES

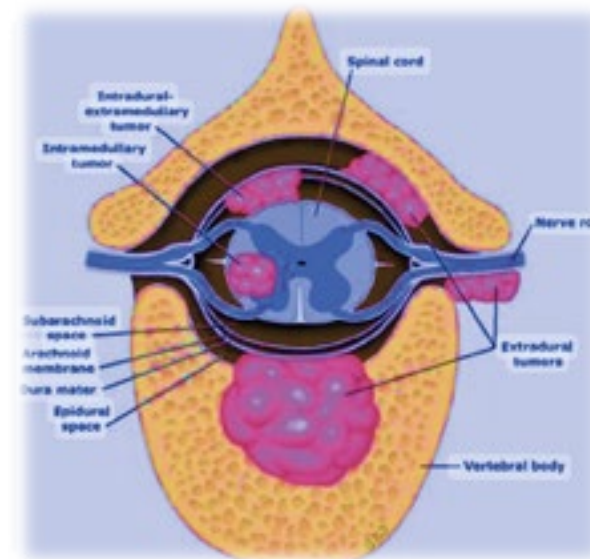
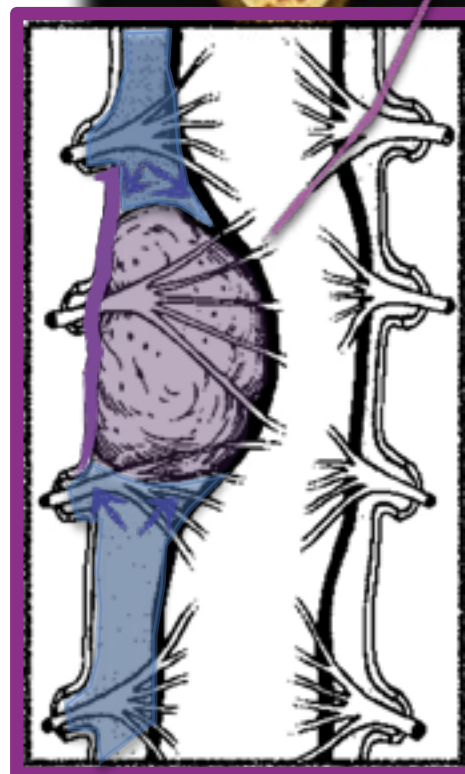
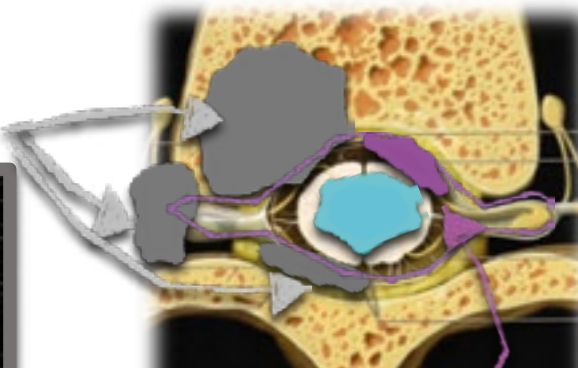


10-15%

Tumores INTRAMEDULARES



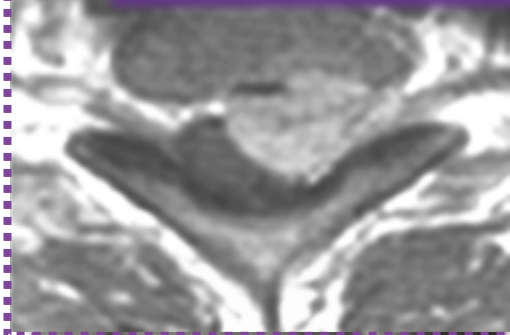
EXTRADURALES



INTRADURALES-EXTRAMEDULARES

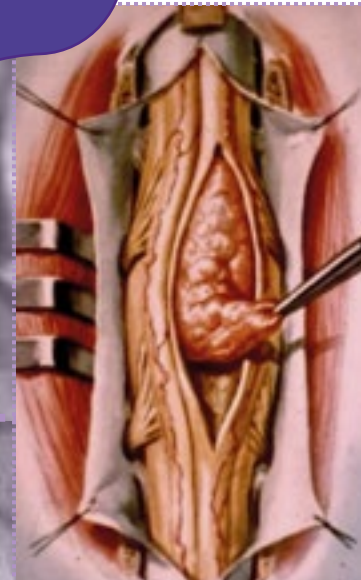
INTRADURALES-EXTRAMEDULARES

40%



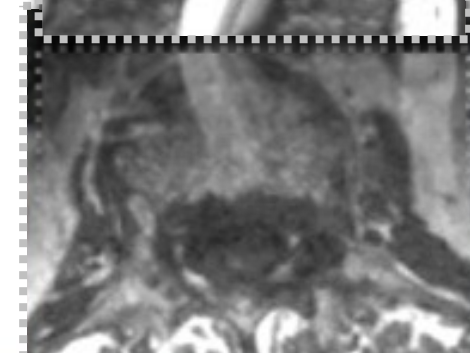
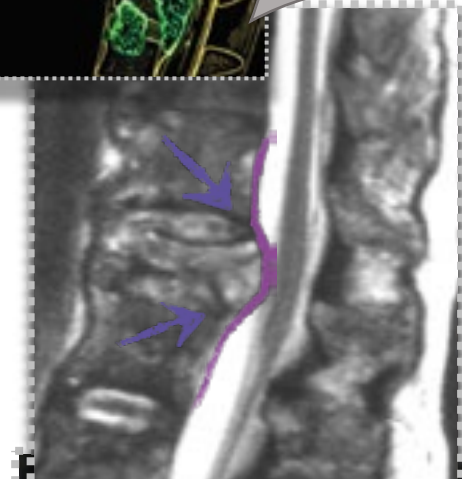
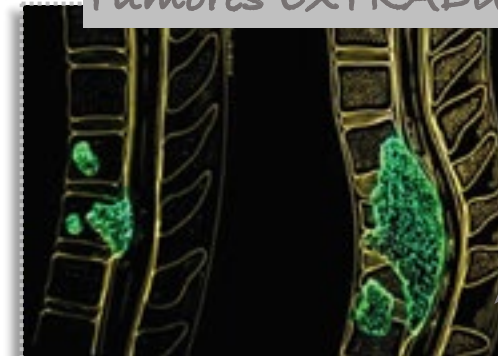
Tumores INTRAMEDULARES

10%



Tumores EXTRADURALES

50%



10% Tumores INTRAMEDULARES



MÉDULA

Cél. EPENDIMARIAS

EPENDIMOMAS
SUBEPENDIMOMAS

NEURONAS y GLÍA

ASTROCITOMAS
GANGLIOGLIOMAS
TUMORES EMBRIONARIOS

VASOS

HEMANGIOBLASTOMAS
MALF. VASCULARES

LCR

METÁSTASIS
LINFOMA...

T. INTRAMEDULARES...en localización INTRADURAL-EXTRAMEDULAR
EPENDIMOMA, HEMANGIOBLASTOMA, LINFOMA



60%

EPENDIMOMAS

60% tumores Gliales. ADULTOS. Proviene cél. ependimarias canal. Mutación gen NF2

TIPOS: **EPENDIMOMA (WHO 2-3):** NF2 mut (Cr. 22q loss). Rg. Cervical > Lumbar > Dorsal
AMPLIFICACIÓN MYCN: Histológicamente agresivo (Mtx, recidiva, peor pronóstico) RAROS
SUBEPENDIMOMA: 6q delec.
MIXOPAPILAR: WHO 2, cono medular, cls. ependimarias filum

Crecimiento lento. Bordes definidos. Degeneración quística-hemorragia. Asociado a síringomielia

RX/TC: Escoliosis, ensanchamiento canal

R.M.: T1: Iso o hipointenso. Puede haber atrofia medular

T2: "Cap sign". Hiperintenso. Edema medular asociado

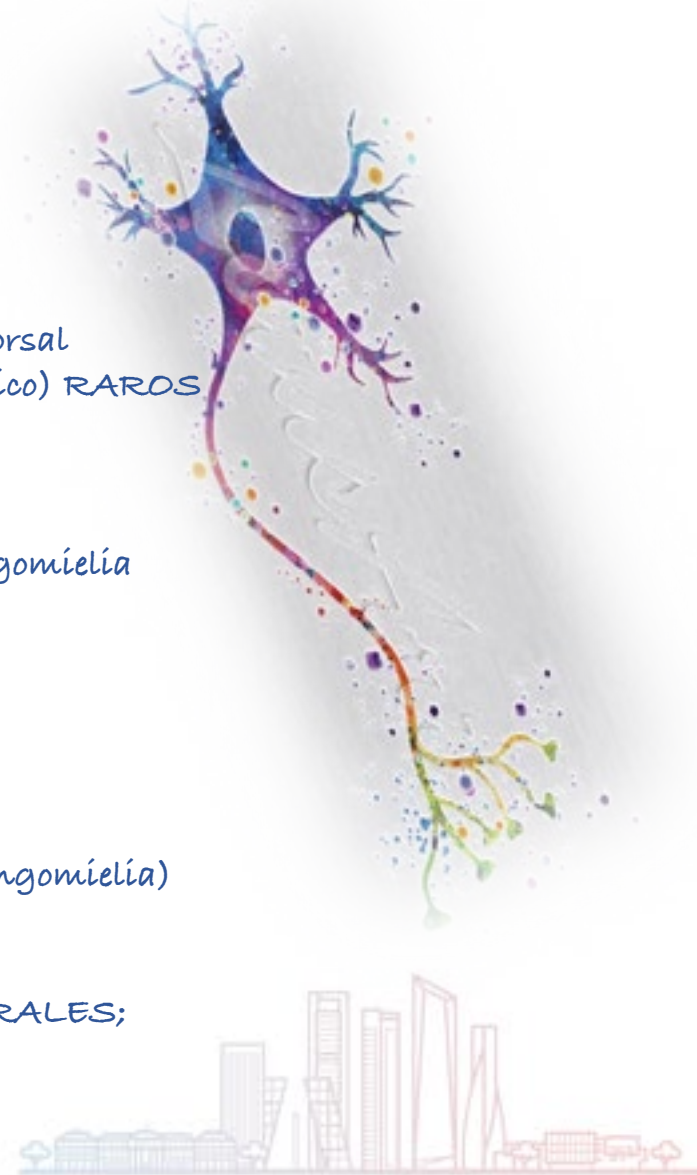
Capta cte. Heterogéneo (necrosis, quistes, hemorragia). No Calcificación

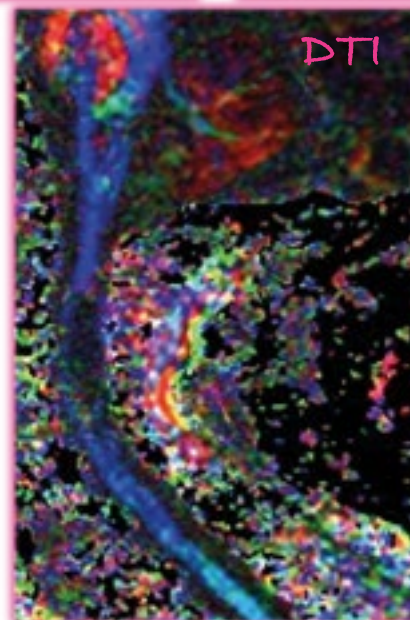
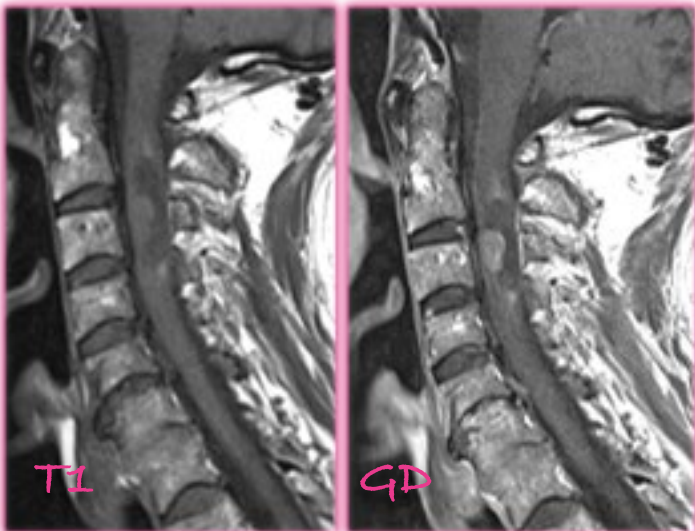
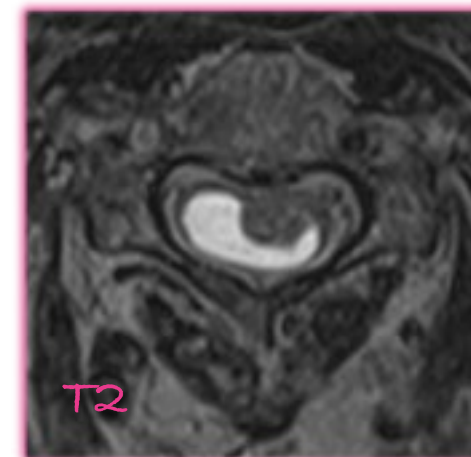
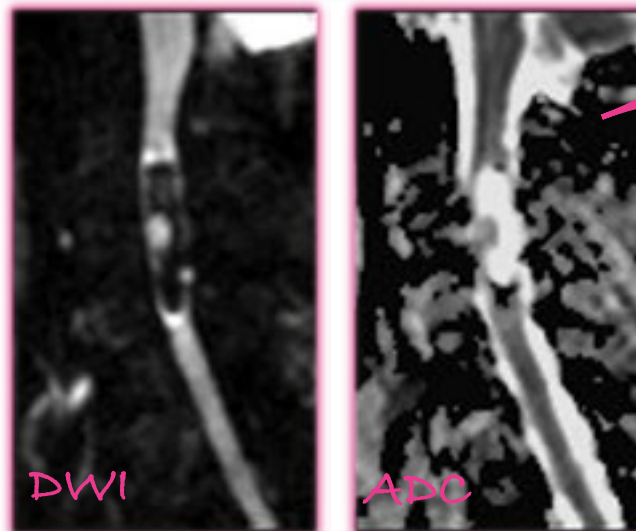
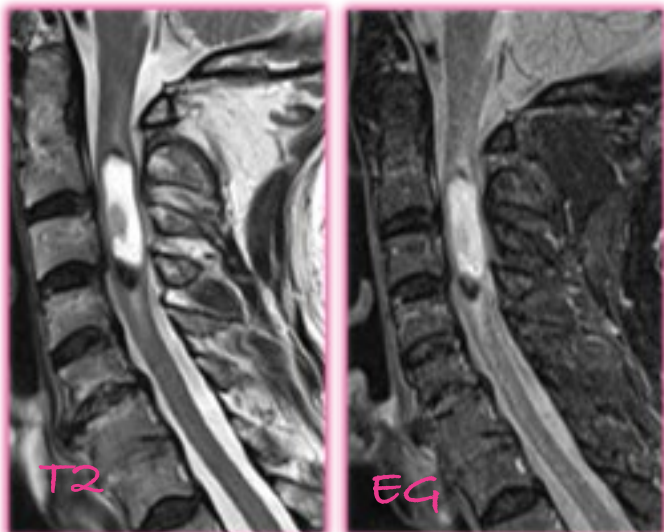
D.D.: **ASTROCITOMA** (excéntrico, más infiltrante, -frec hemorragia, quistes tumor, síringomielia)

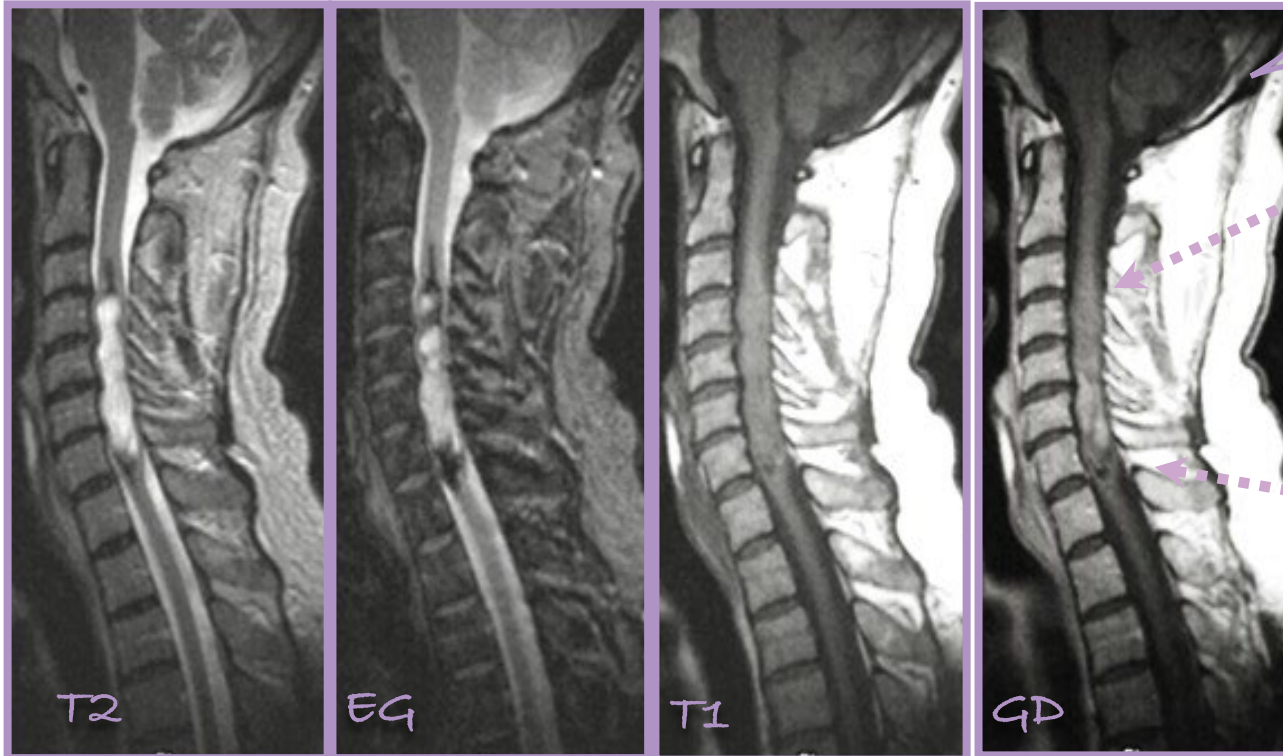
HEMANGIOBLASTOMA; DESMIELINIZANTES (ADEM, E.M.)

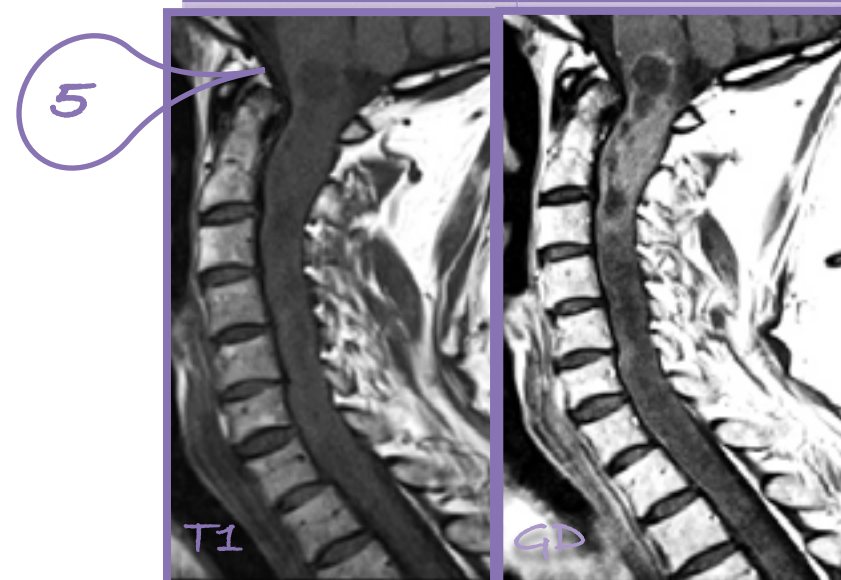
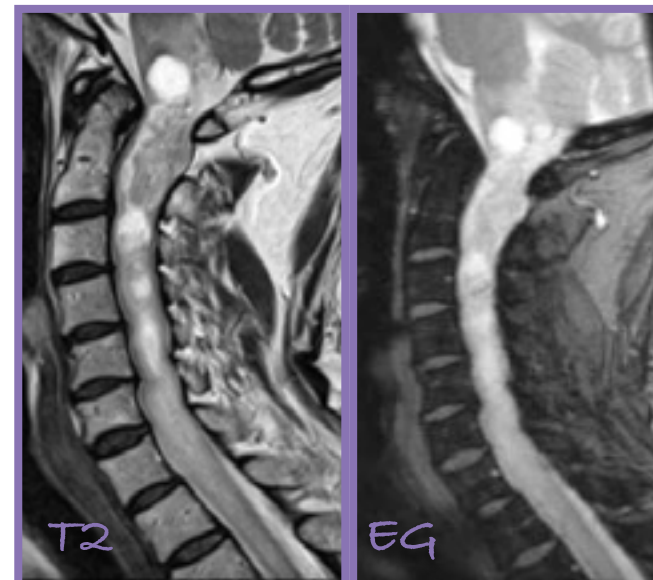
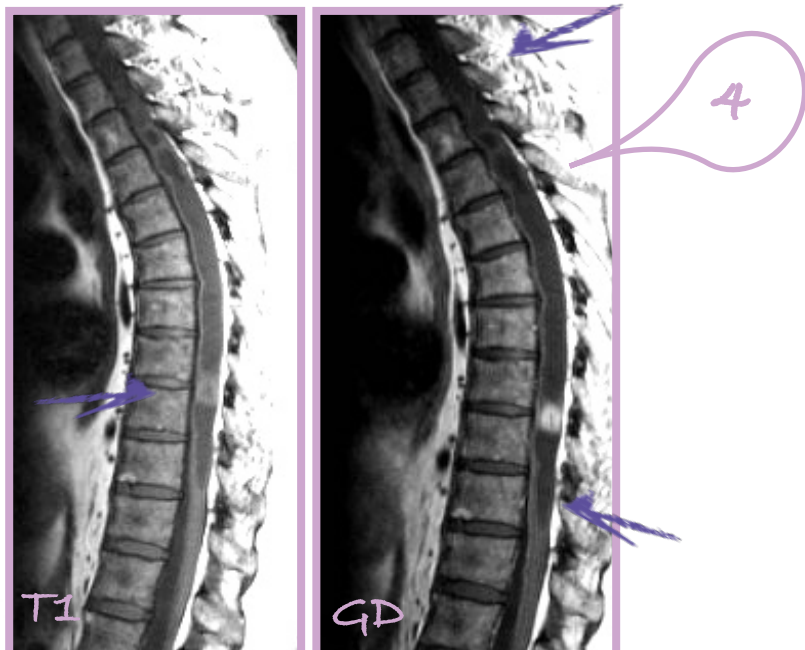
MIELITIS TRANSVERSA, ISQUEMIA MEDULAR

Filum: T. EXTRAMEDULARES (T. vainas NN.; MENINGIOMA; MTX. INTRADURALES;
EPIDERMOIDE)

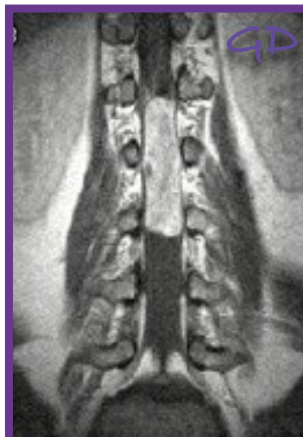
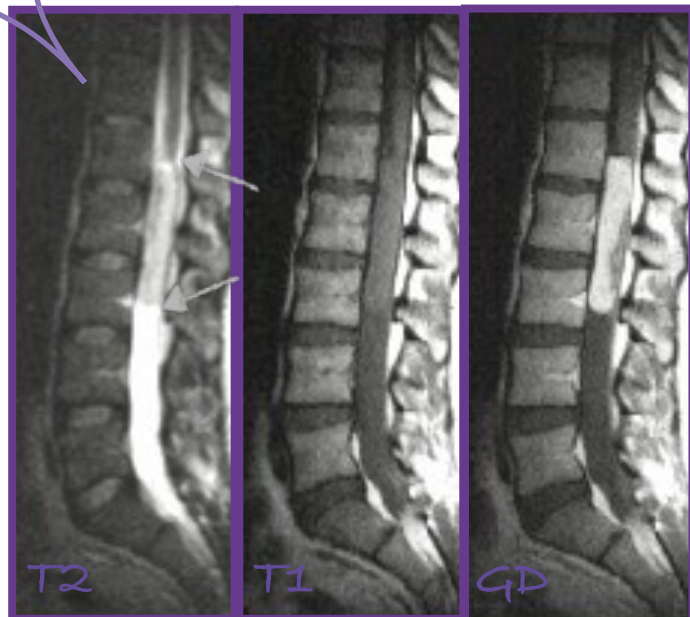








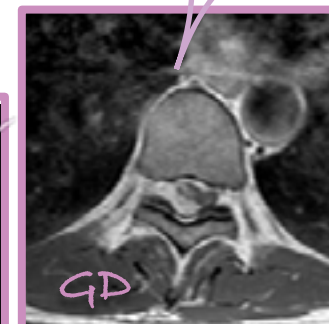
6



13%

EPENDIMOMA MIXOPAPILAR

7





ASTROCITOMAS

30%

30% T. Gliales Adultos. 80% en NIÑOS.

TIPOS : { ASTROCITOMA CIRCUNSCRITO - PILOCÍTICO (WHO 1)
ASTROCITOMA DIFUSO BAJO GRADO (WHO 1,2)
KIAA1549-BRAF mut: mejor pronóstico
BRAF V600E: mayor agresividad.
ASTROCITOMA DIFUSO ALTO GRADO (3,4): H3 K27M mut

Generalmente benignos, PILOCÍTICO (WHO 1)

Rg. Dorsal > Cervical. Puede afectar mas de una región

R.M.: T1: Iso o hipointenso

T2: Hiperintenso. Puede tener degeneración quística

Puede haber ensanchamiento difuso toda médula

+ Infiltrante, captación más homogénea que ependimoma

D.D.:

EPENDIMOMA

MTX; HEMANGIOBLASTOMA; MALF. VASCULAR; INFARTO MEDULAR;

MIELITIS (Infecciosa / Inflamatoria)





1

1º Control

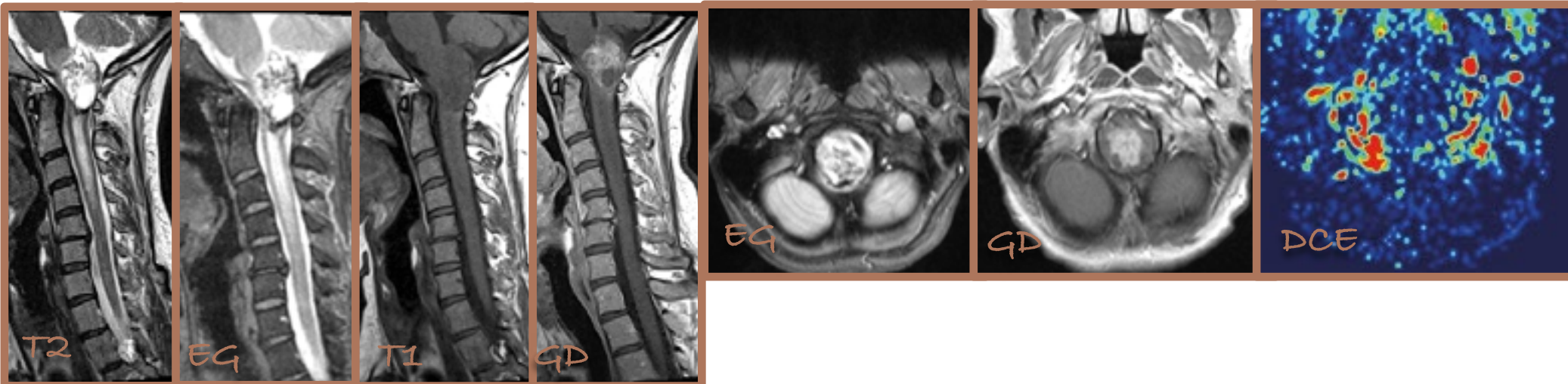


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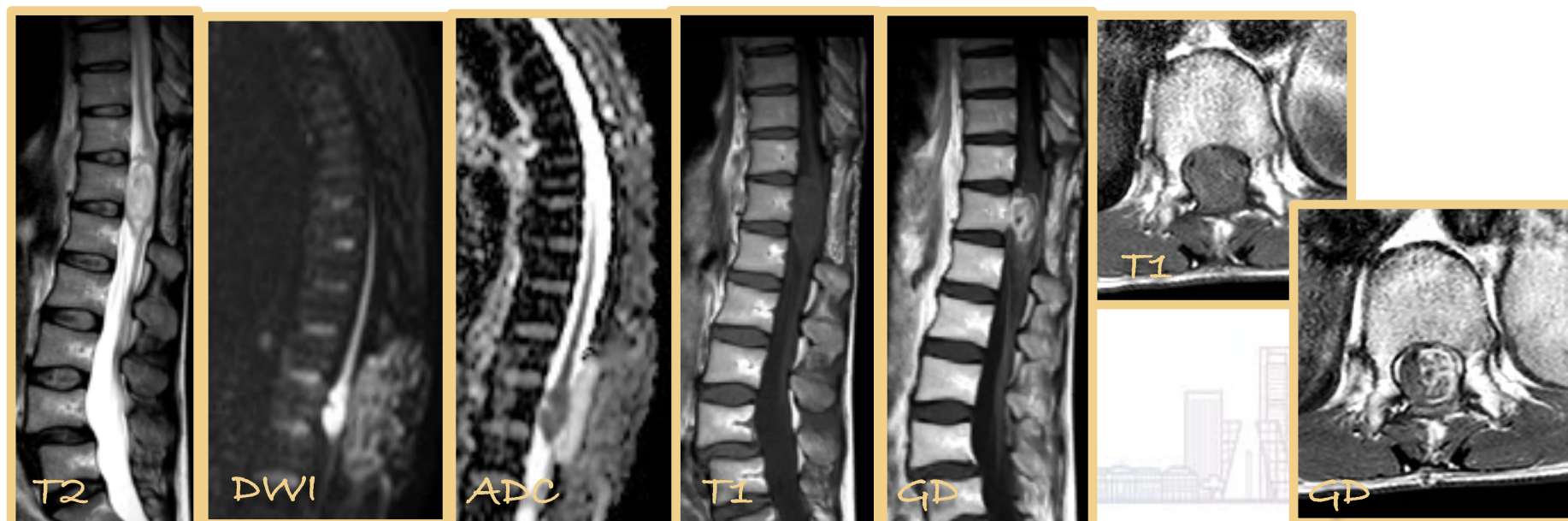
2º Control



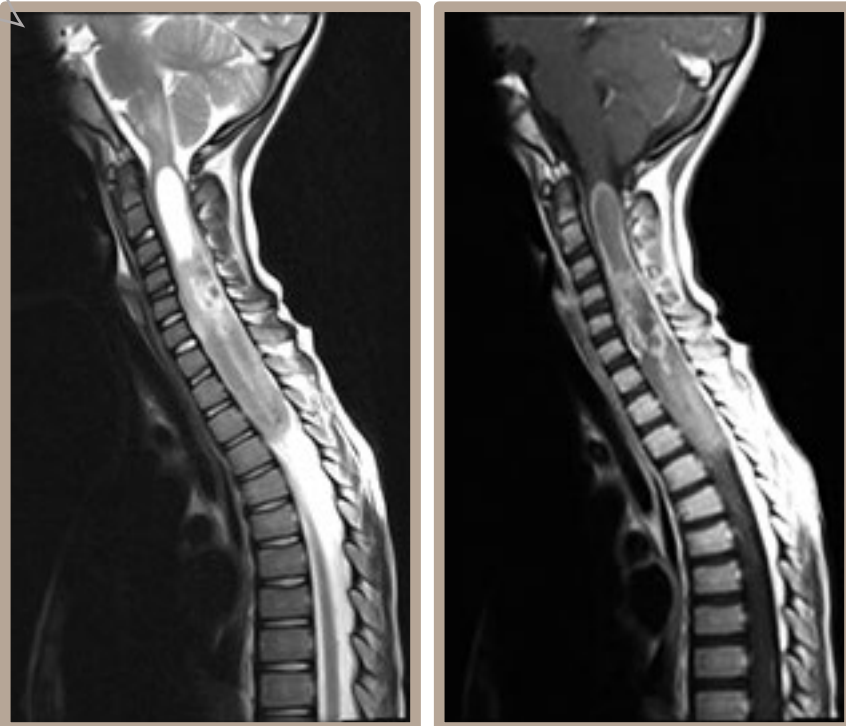
ASTROCITOMA
PILOCÍTICO



ASTROCITOMA
WHO 4

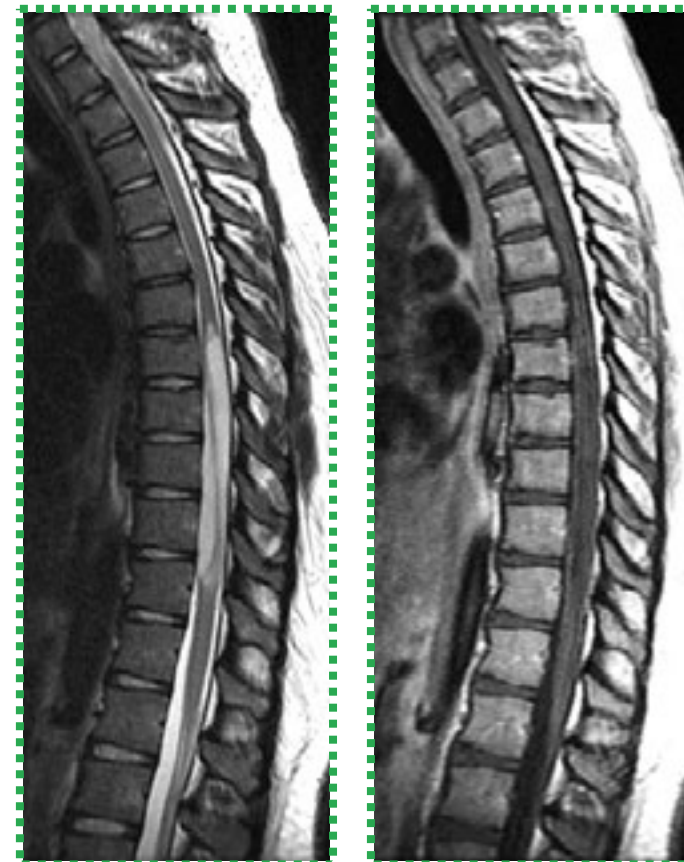


< 1%



GANGLIOGLIOMA

1%



SUBEPENDIMOMA

7%

HEMANGIOBLASTOMAS

1-7% tumores intramedulares

WHO 1. Rg. Cervico-dorsal.

80% solitario. 20% Von Hippel Lindau (gen VHL mut.)

60% intramedular, subpiales posteriores; < intra < extradural (RAROS)

Típos: Celular y reticular

R.M.: T1: Iso-Hípoíntenso

T2: Hiperíntenso (> LCR). Hemorragia frec. Siringomielia

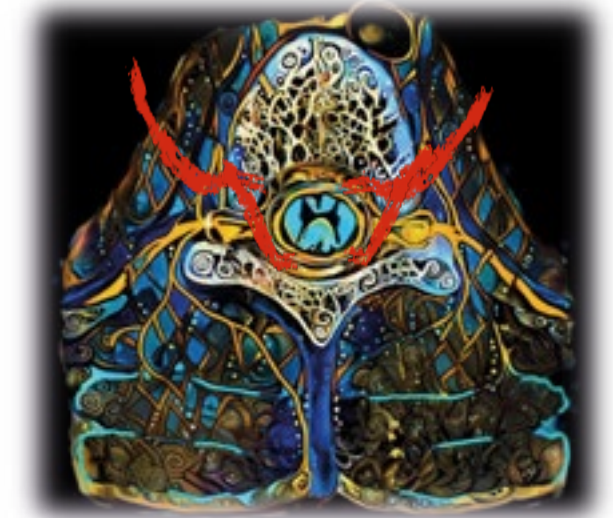
Edema medular (ensanchamiento desproporcionado)

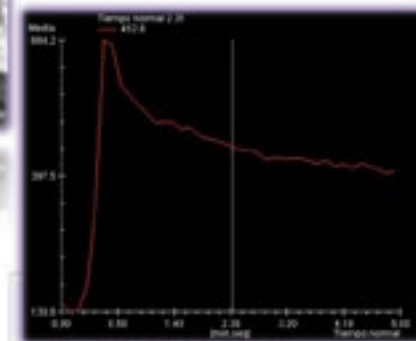
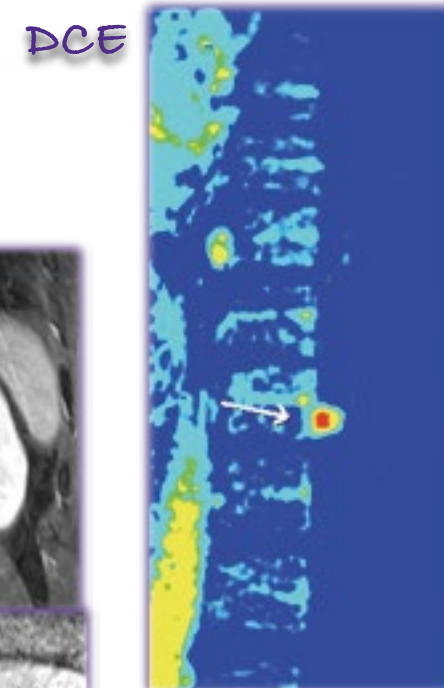
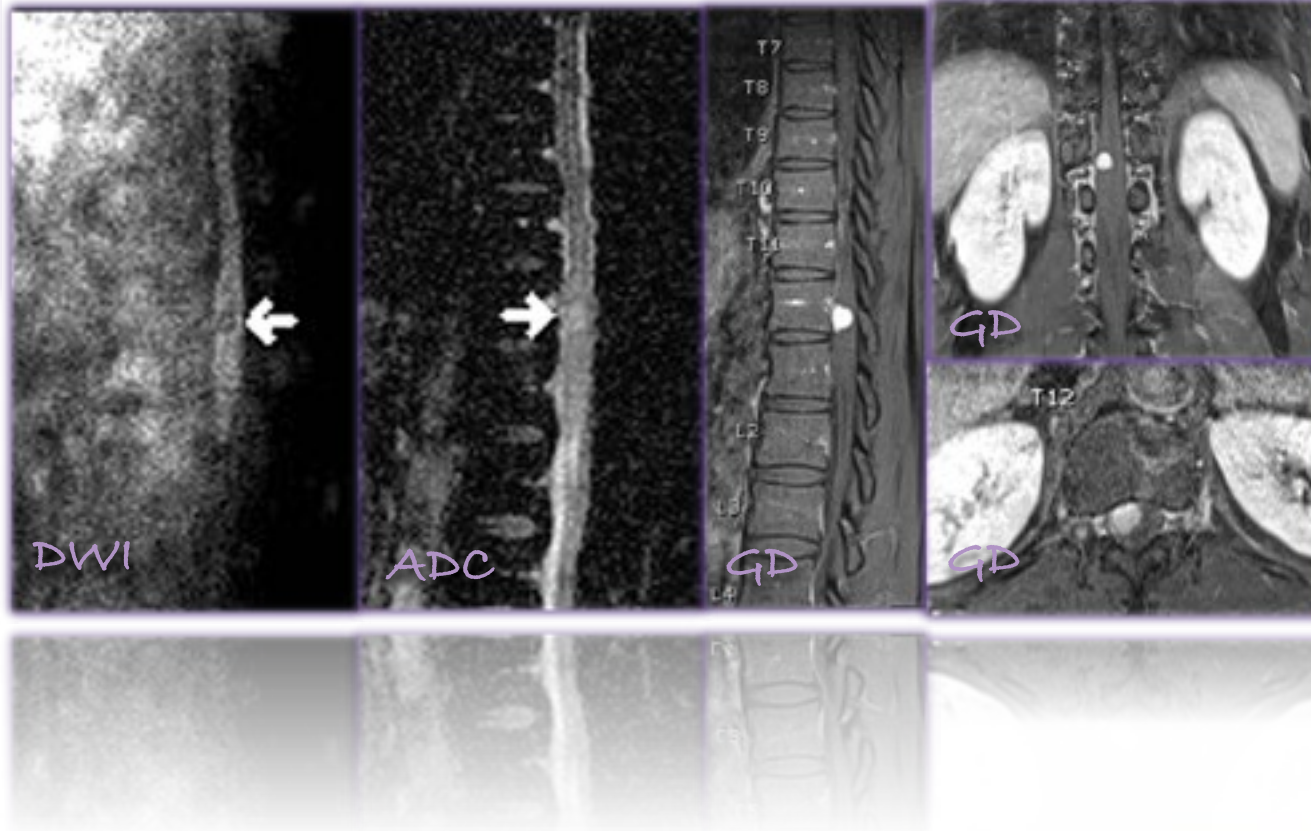
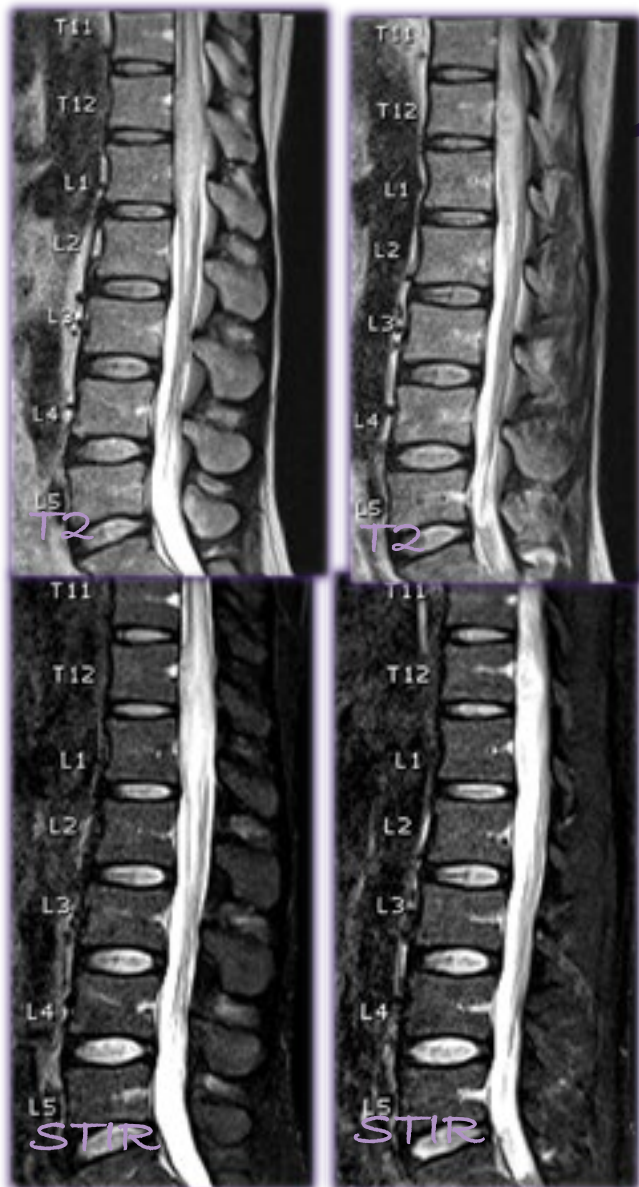
Quiste + nódulo que capta cte. Varices meníngeas 50%

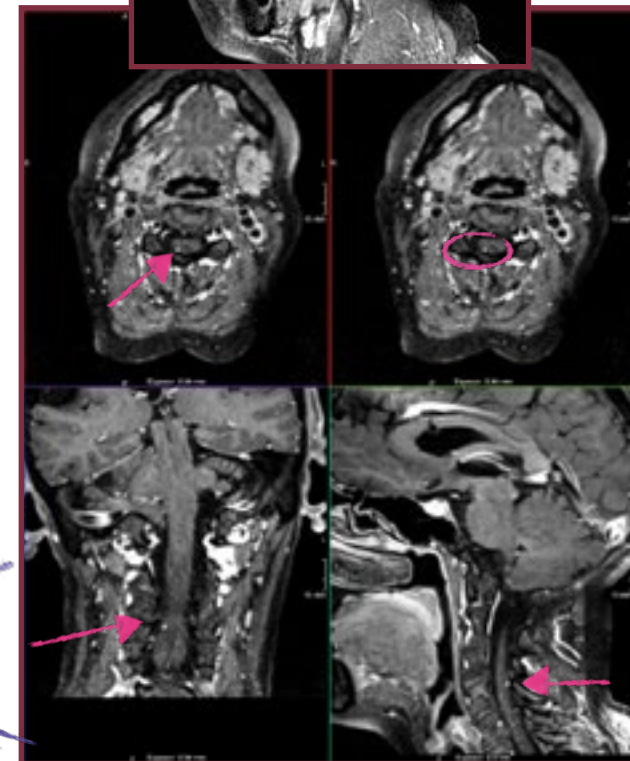
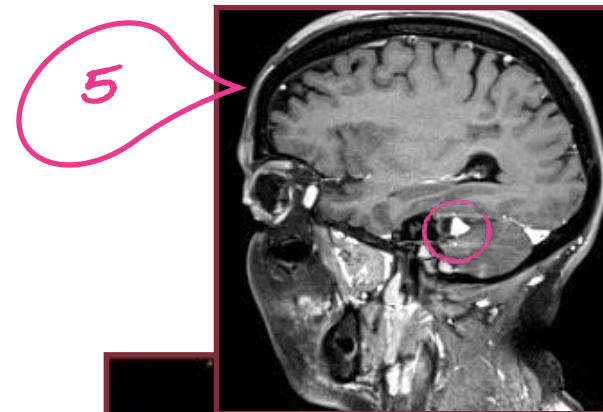
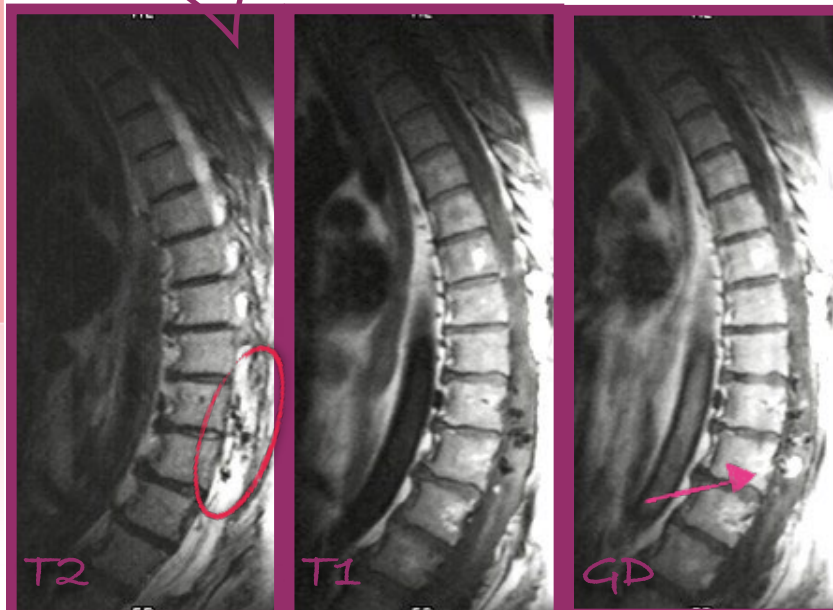
D.D.:

Intramedulares: AVM; CAVERNOMA; EPENDIMOMA; ASTROCITOMA

Extramedulares: MENINGIOMA; T. VAINAS NN.

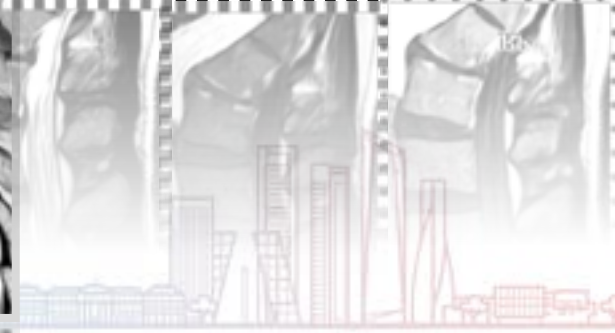
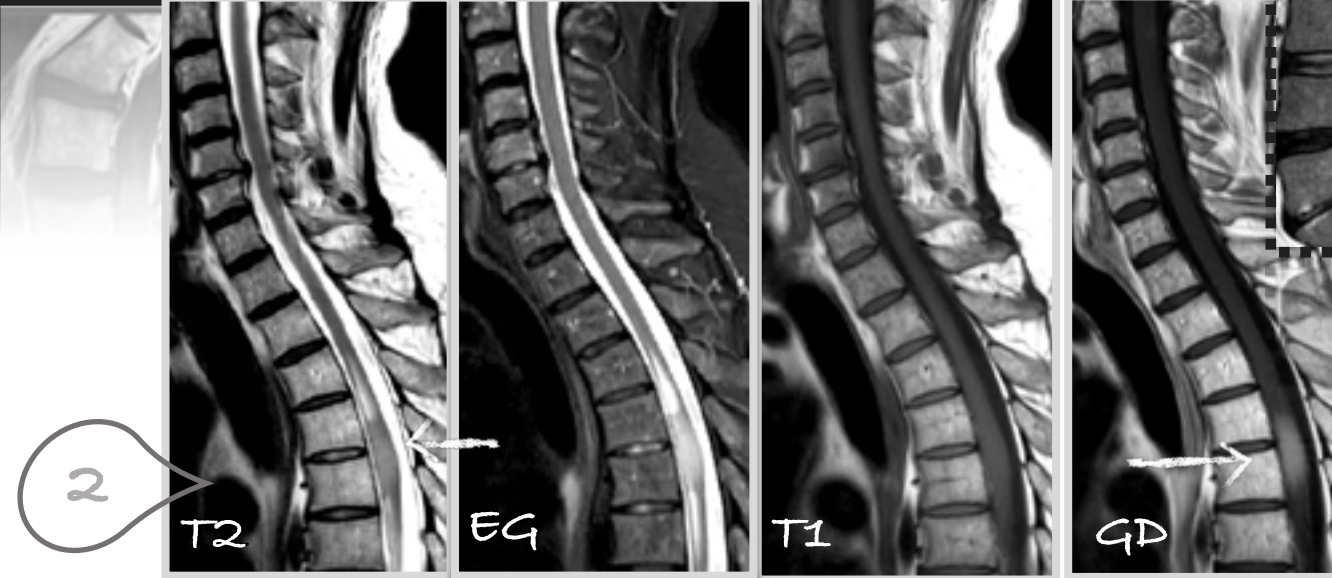
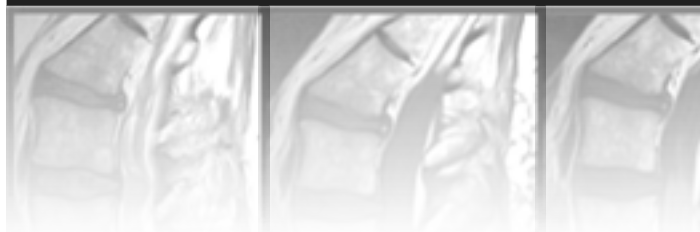
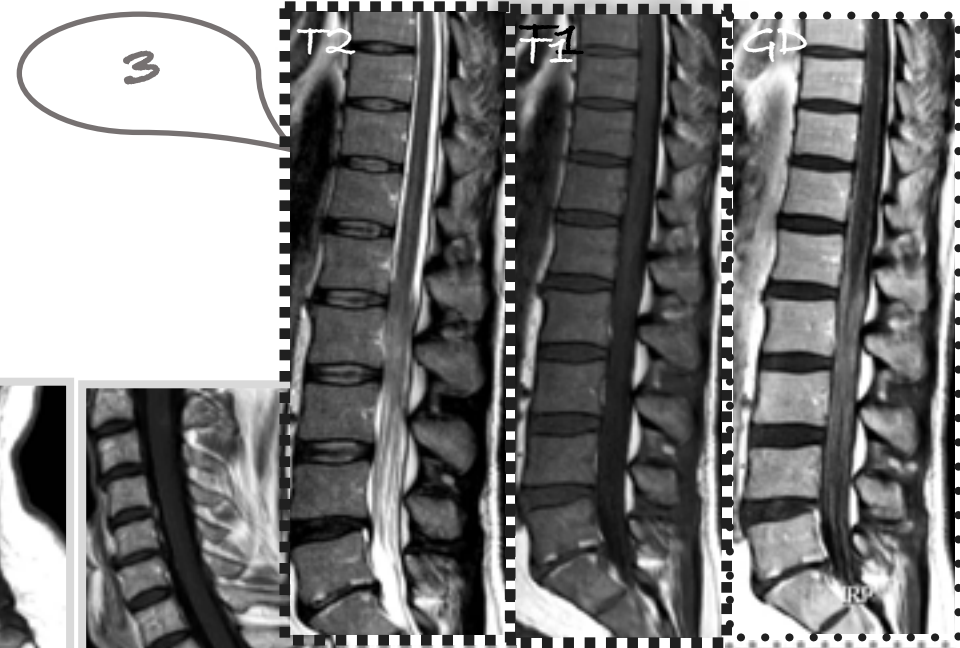
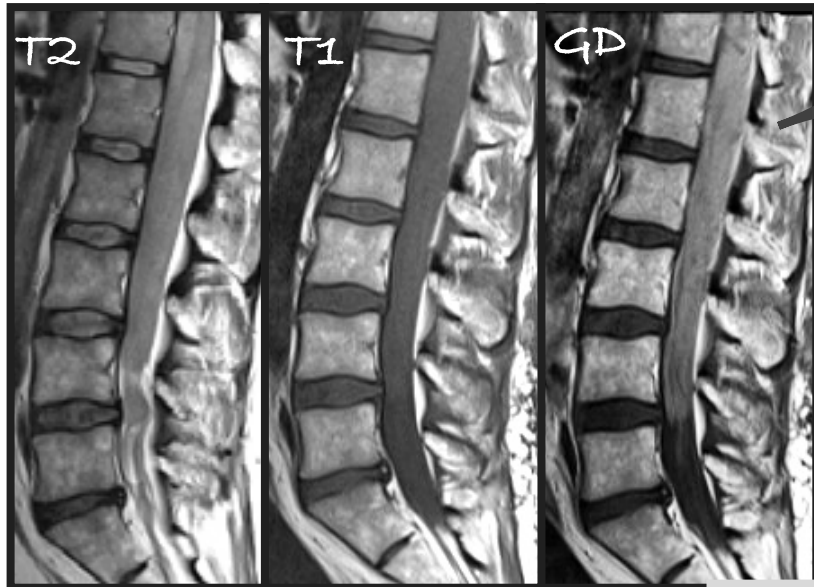
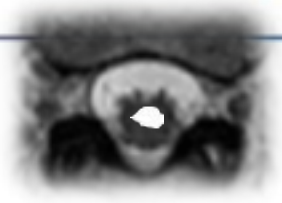


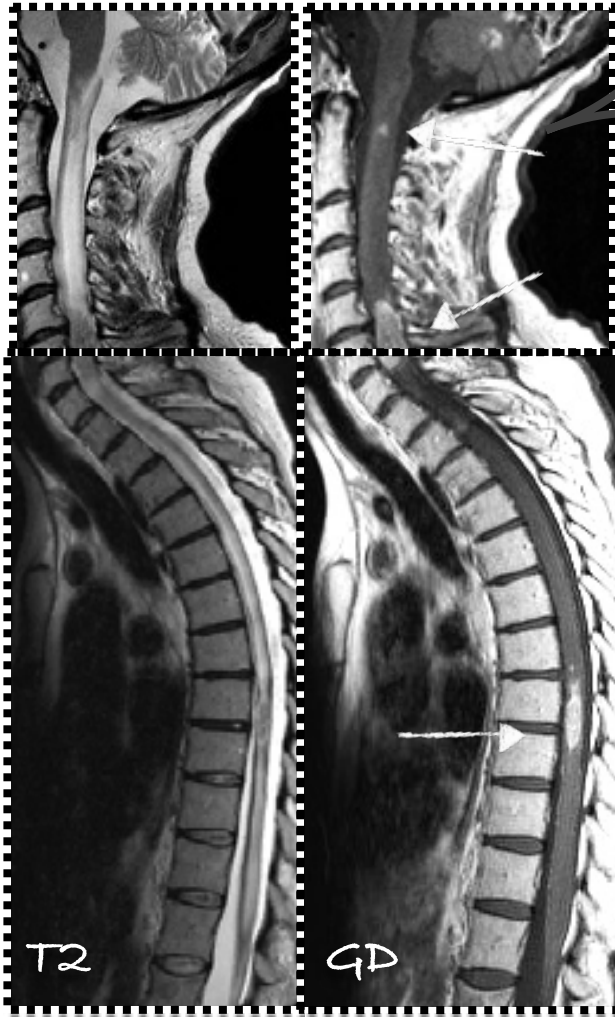




1%

LINFOMA





1

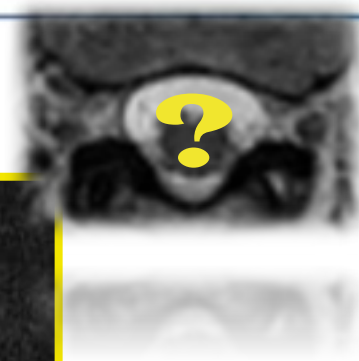
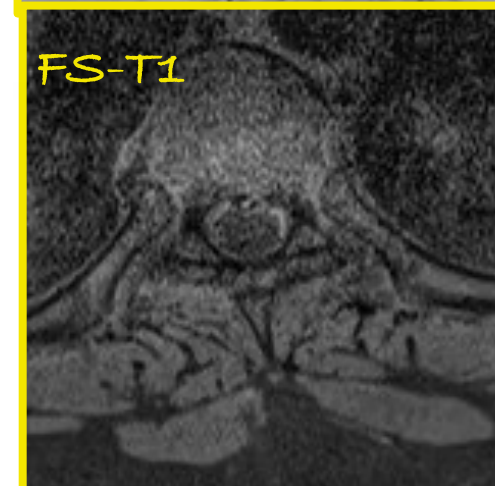
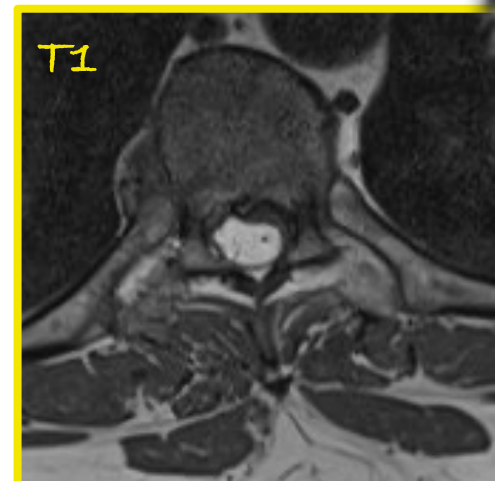
2

1% METÁSTASIS



< 1%

LIPOMA INTRAMEDULAR



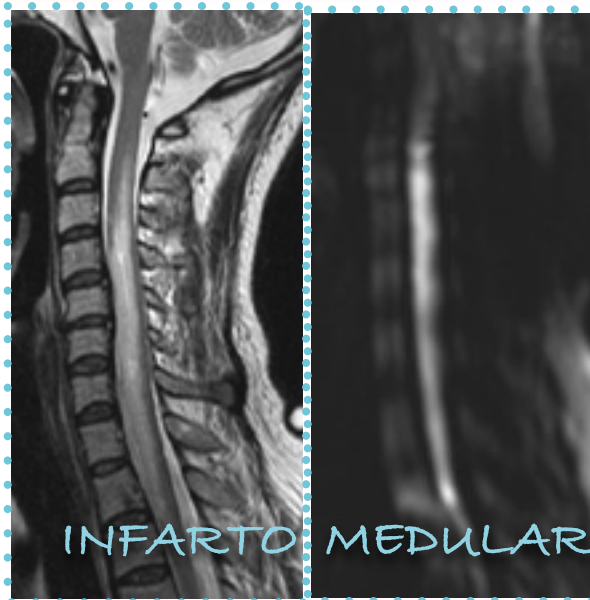
DIAGNÓSTICO DIFERENCIAL

MIELITIS

TRANSVERSA



HISTIOCITOSIS



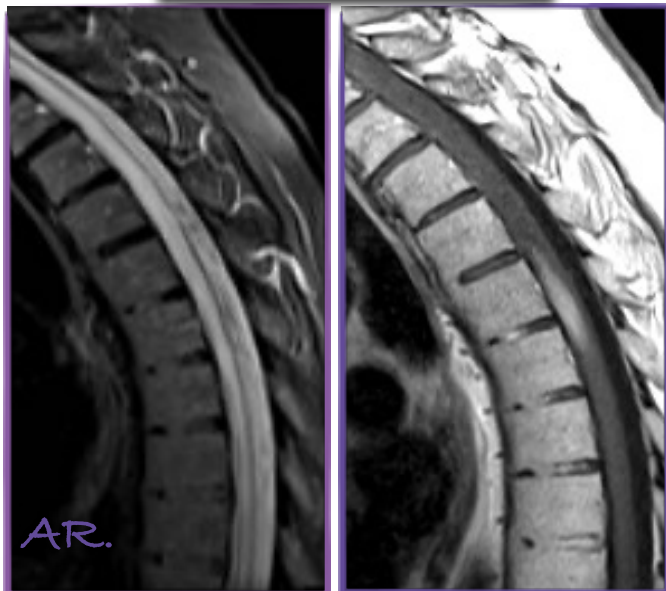
INFARTO MEDULAR



ABSCESO MEDULAR

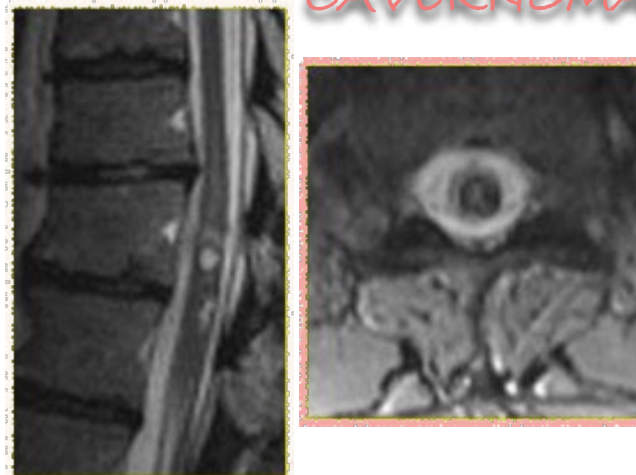


E.M.



AR.

CAVERNOMA



FÍSTULA DURAL



40%

TUMORES INTRADURALES-EXTRAMEDULARES



Espacio INTRADURAL-EXTRAMEDULAR

MENINGES

MENINGIOMAS

T. FIBROSO SOLITARIO

NERVIOS

NEURINOMAS

NEUROFIBROMAS -

T. MALIGNO VV NN

PARAGANGLIOMAS

VASOS

MALFORMACIONES
VASCULARES

LCR

METÁSTASIS

FILUM TERMINAL

MASAS del
DESARROLLO

T. INTRAMEDULARES-EXTRADURALES...en localización INTRADURAL-EXTRAMEDULAR

EPENDIMOMA - HEMANGIOBLASTOMA - LINFOMA - PLASMOCITOMA...



25%

MENINGIOMAS

Proviene de cél. meningoendoteliales aracnoideas. Anclaje dural por infiltración

Alt. Cromosomas 22, 1p, 9p, 10q, 5p y 17q

WHO 1-3. La mayoría benignos (WHO 1).

TIPOS: WHO 1-3. Subtipos: $\left\{ \begin{array}{l} + \text{ frec: Psamomatoso o meningoendotelial.} \\ - \text{ frec: Transicional, fibroso, angiomaso, metaplásico, ...} \end{array} \right.$

Sexo femenino. Rg. torácica

Solitarios (2% múltiples, NF)

80% intradurales (pueden ser intraóseos)

Dorsolaterales (rg. torácica), Anteriores (cervical)

Recurrencia <10%. Extradurales y Jóvenes: más invasivos.

Ca++ > morbilidad @

R.M.: T1: Iso o hipointenso

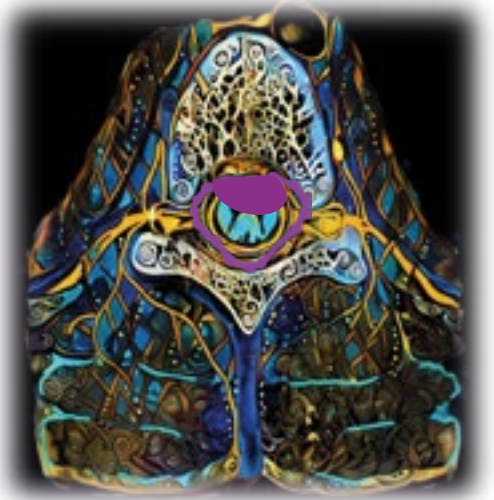
T2: Isoíntenso. Poco ss. para el Ca++ (RX / TC)

Captación homogénea, intensa. Anclaje dural extenso

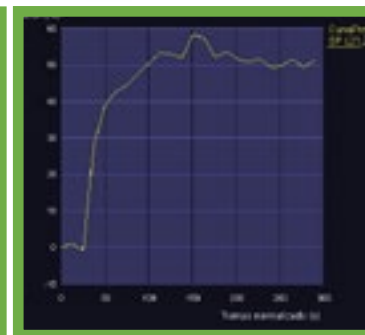
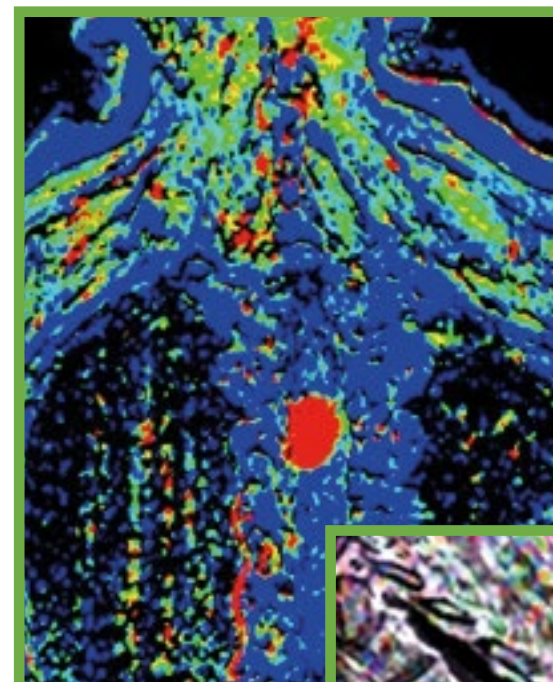
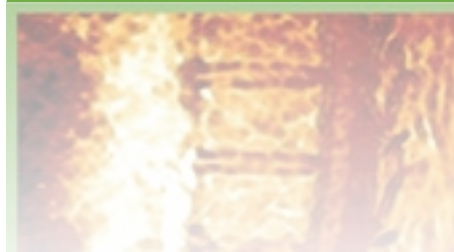
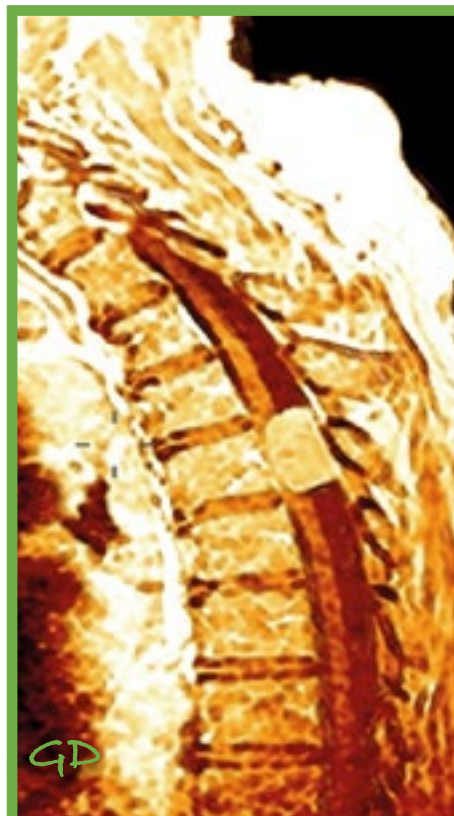
D. D.:

SCHWANOMA: T2-Hiperint; quistes intratumor; > tamaño; < edad; no anclaje dural; rg. Lateral

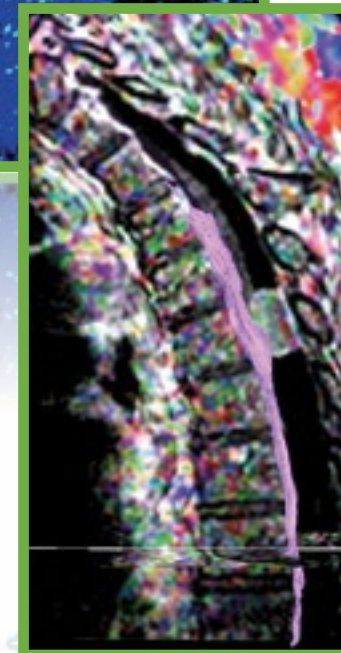
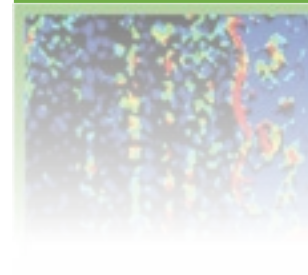
PARANGLIOMA, EPIDERMÓIDE, MTX. INTRADURALES, LINFOMA



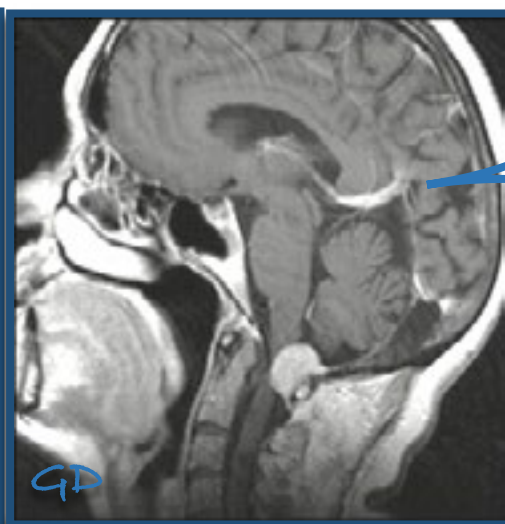
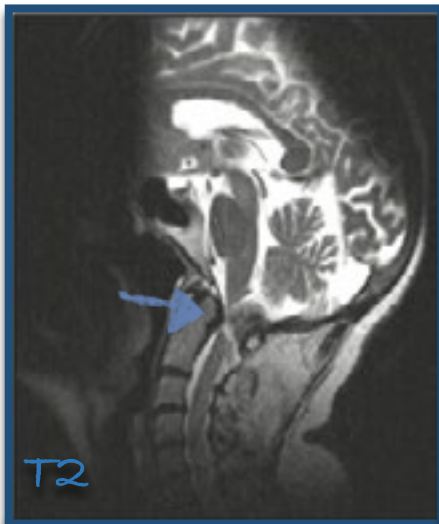
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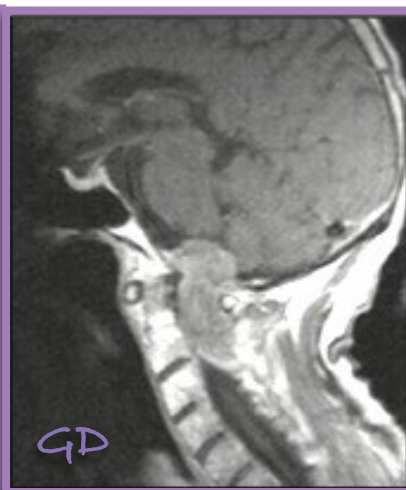
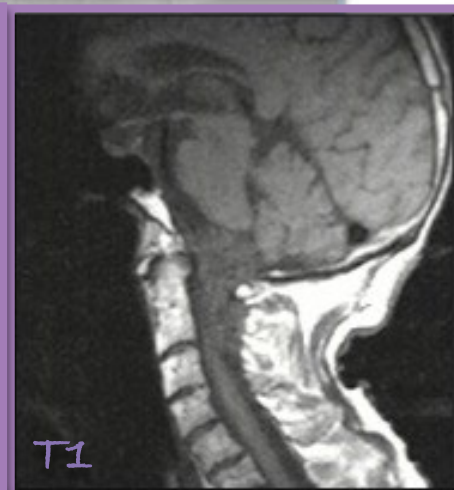
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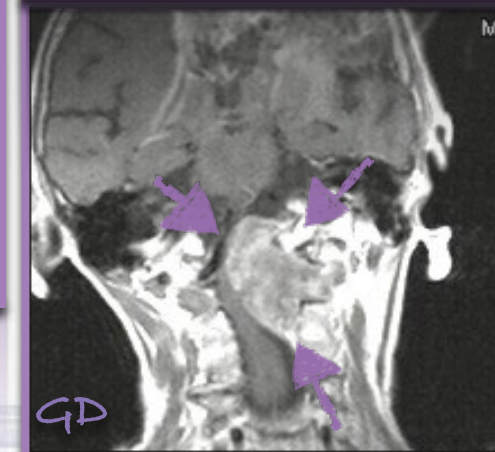
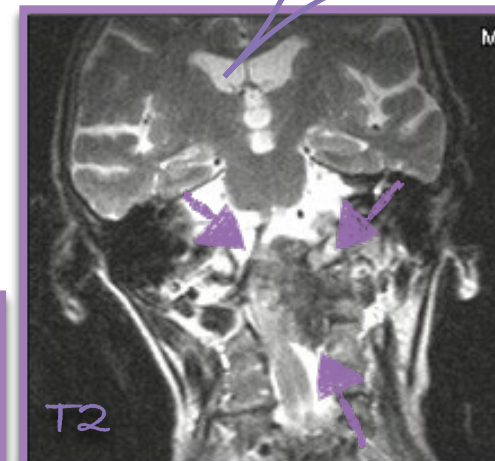
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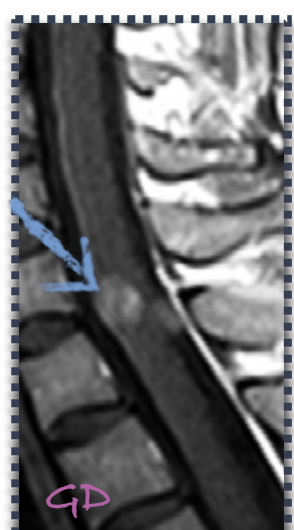
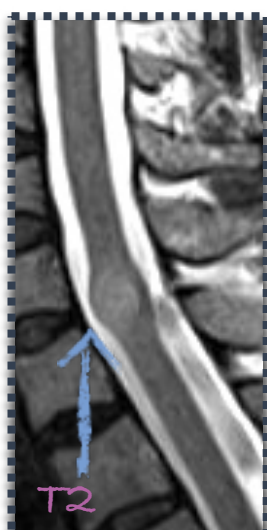
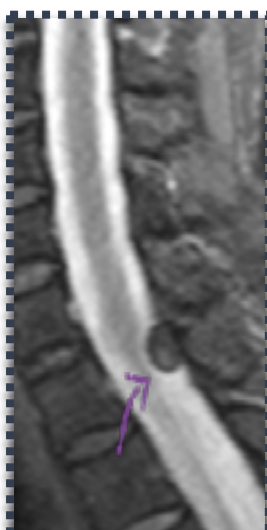


2



3



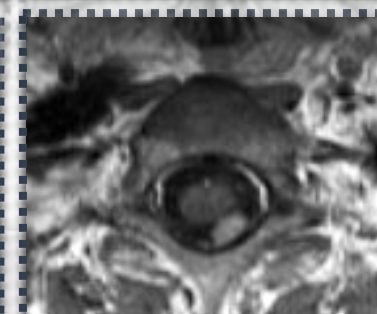
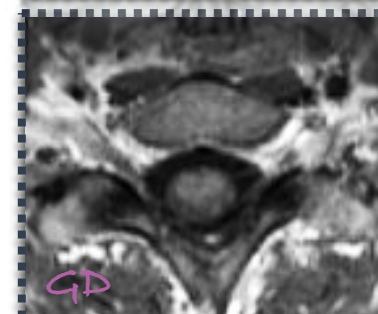
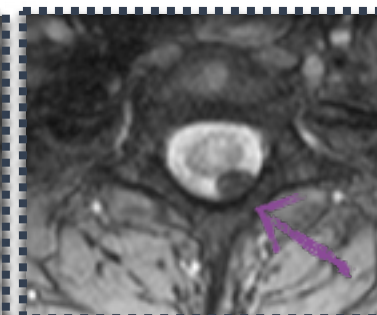
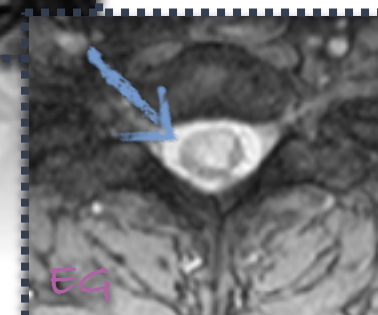
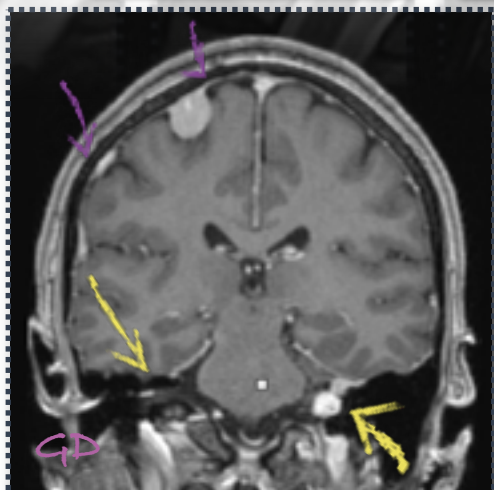


NEURINOMA

MENINGIOMA

EPENDIMOMA

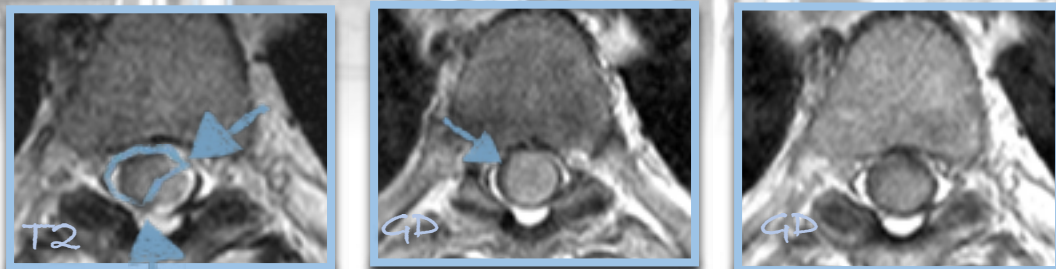
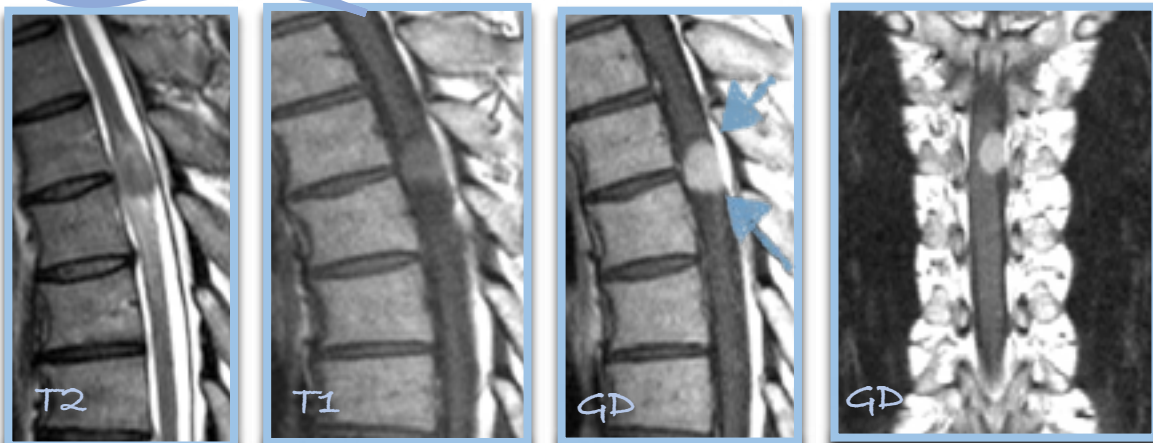
NF II



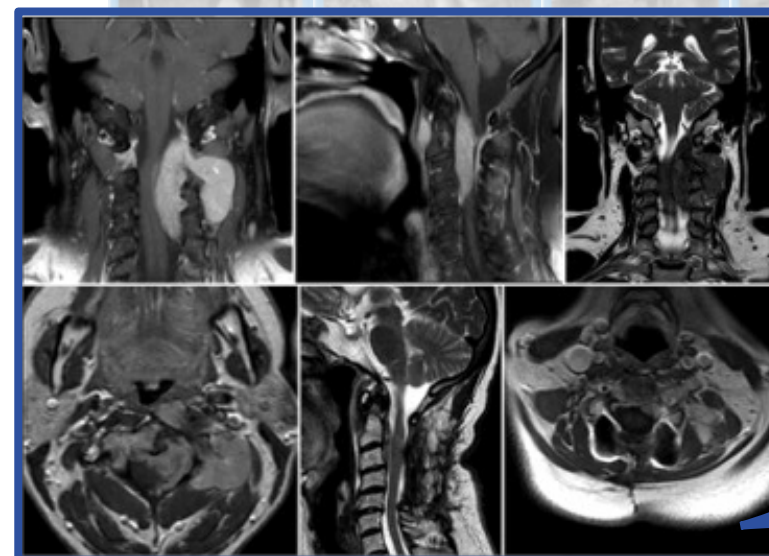
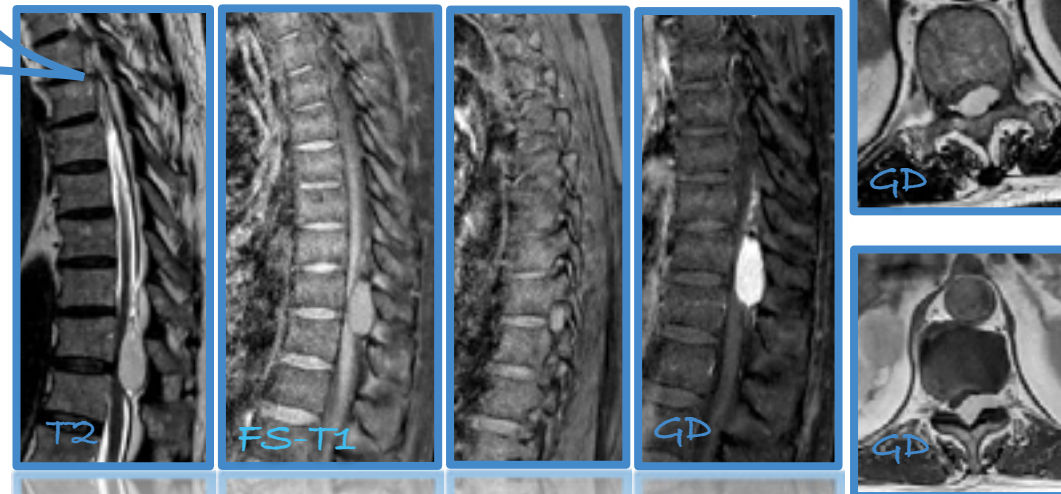
< 1%

TUMOR FIBROSO SOLITARIO

WHO 1

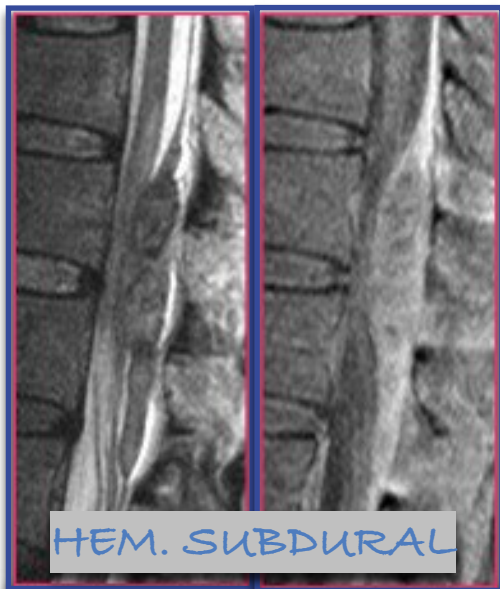


TFS WHO 2

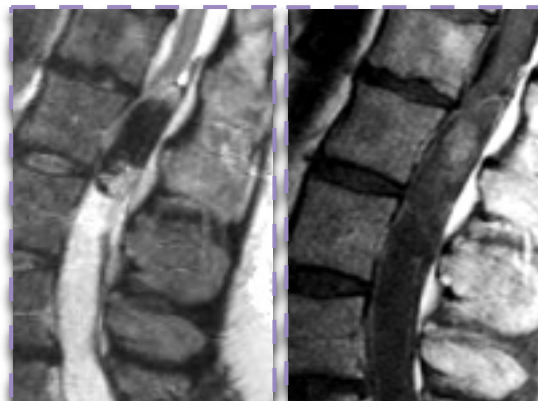


TFS WHO 3

Q. ARACNOIDEO



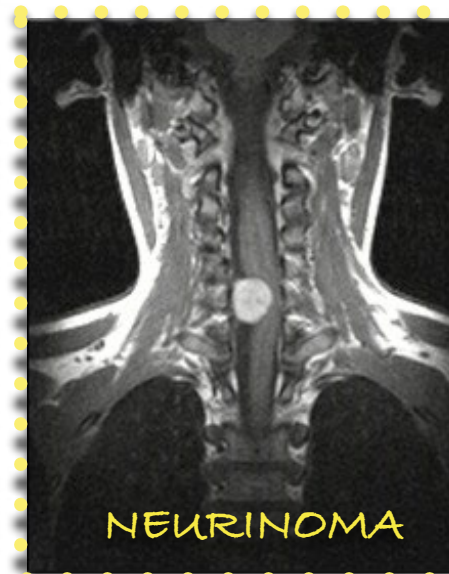
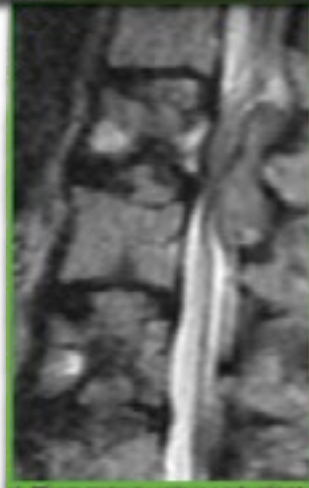
HEM. SUBDURAL



ARACNOIDITIS OSIFICANTE



PLASMOCITOMA



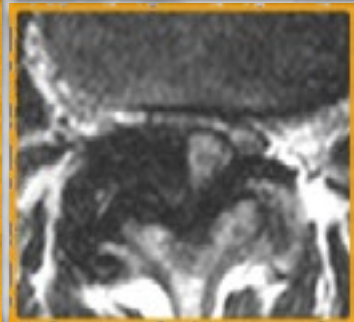
NEURINOMA



MTX



QUISTE SINOVIAL



30%

TUMORES de la VAINA NERVIOSA

2/3 son intradurales (15% mixtos, 15% extradurales, intramed raros)
Rg. Torácica - Cervical, cola de caballo. Gnalmente afectan rr. Dorsales Dorsolaterales. Imagen en "reloj de arena" / Dumbbell
T. malignos primarios son raros
Deg. Sarcomatosa: 4-11% neurofibromas (NF - I)

NEURINOMA:

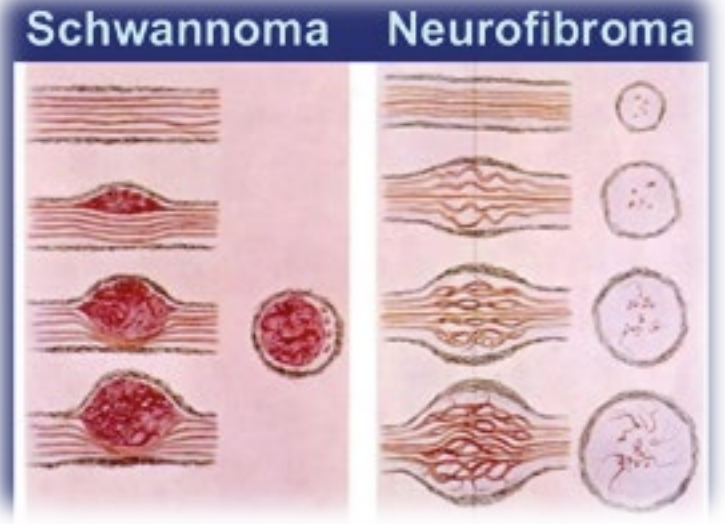
Lobulado, encapsulado, solitario, oval
40%: hemorragia - deg. quística cital

Patrones histológicos:
Antoni A / cuerpos de VEROCAY
Antoni B (heterogeneidad)



NEUROFIBROMA:

Fusiforme, no cápsula, múltiple (NF- I)
TIPOS: localizados, difusos, plexiformes
Raro Ca++ / hemorragia. Cto: fibrocolágeno



TUMORES de la VAINA NERVIOSA

R.M.: T1: Iso o Hipoíntensos

T2: Híper. NEUROFIBROMAS: Cto: Hípo

NEURINOMAS: Cto: $\left\{ \begin{array}{l} \text{Hípo (alta cel., hemorragia, colágeno)} \\ \text{Híper (deg. quística, ...)} \end{array} \right.$

CTE: Captan en periferia

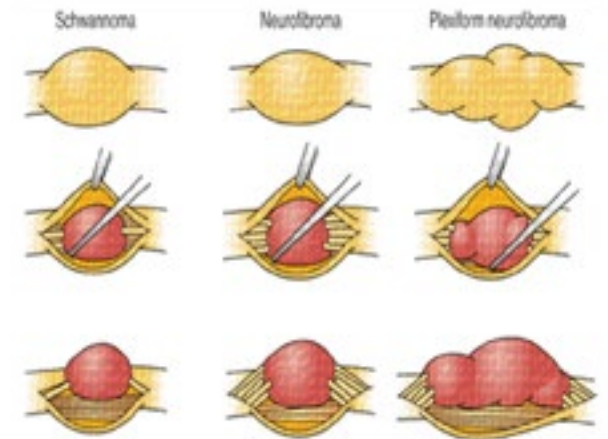
D.D.:

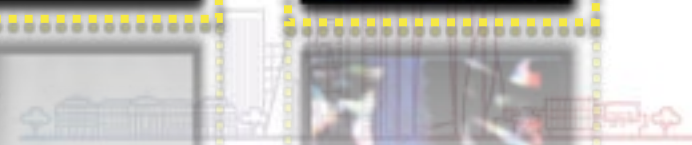
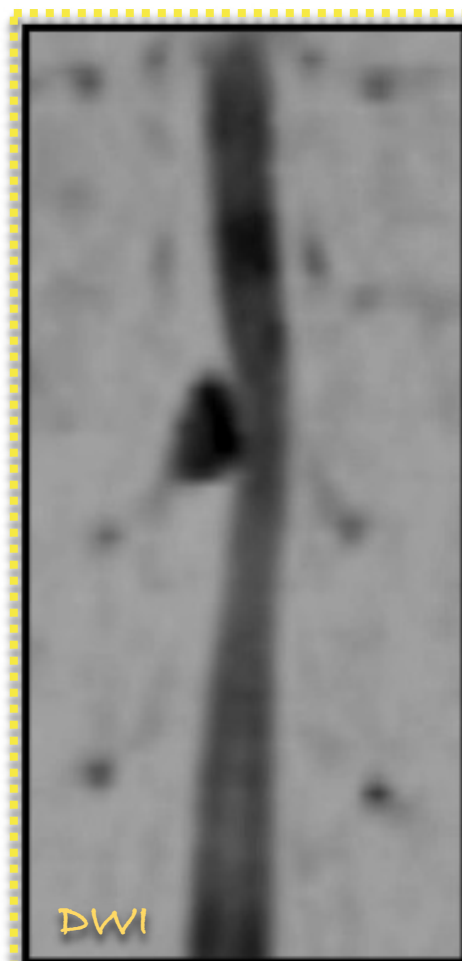
MENINGOCELE: Rg. Torácica lateral. Varios ag. Conjunción, Isoíntensos con LCR

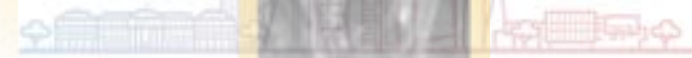
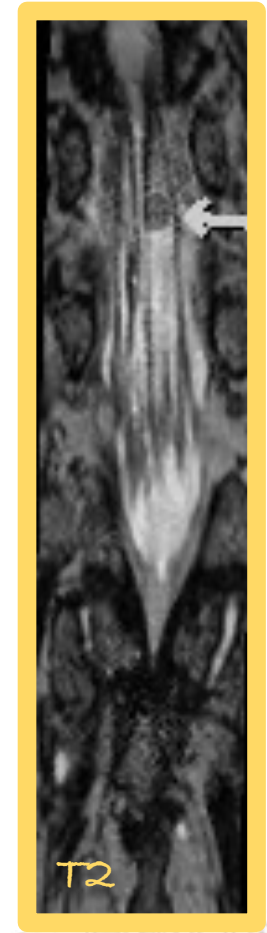
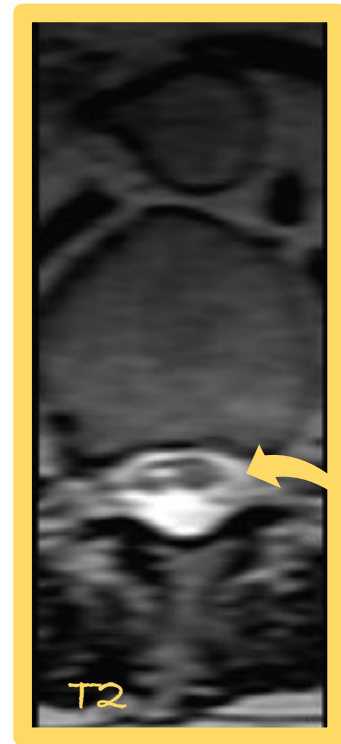
INTRADURALES: EPENDIMOMA, MENINGIOMA, DERMOIDE, HERNIA, NEURITIS

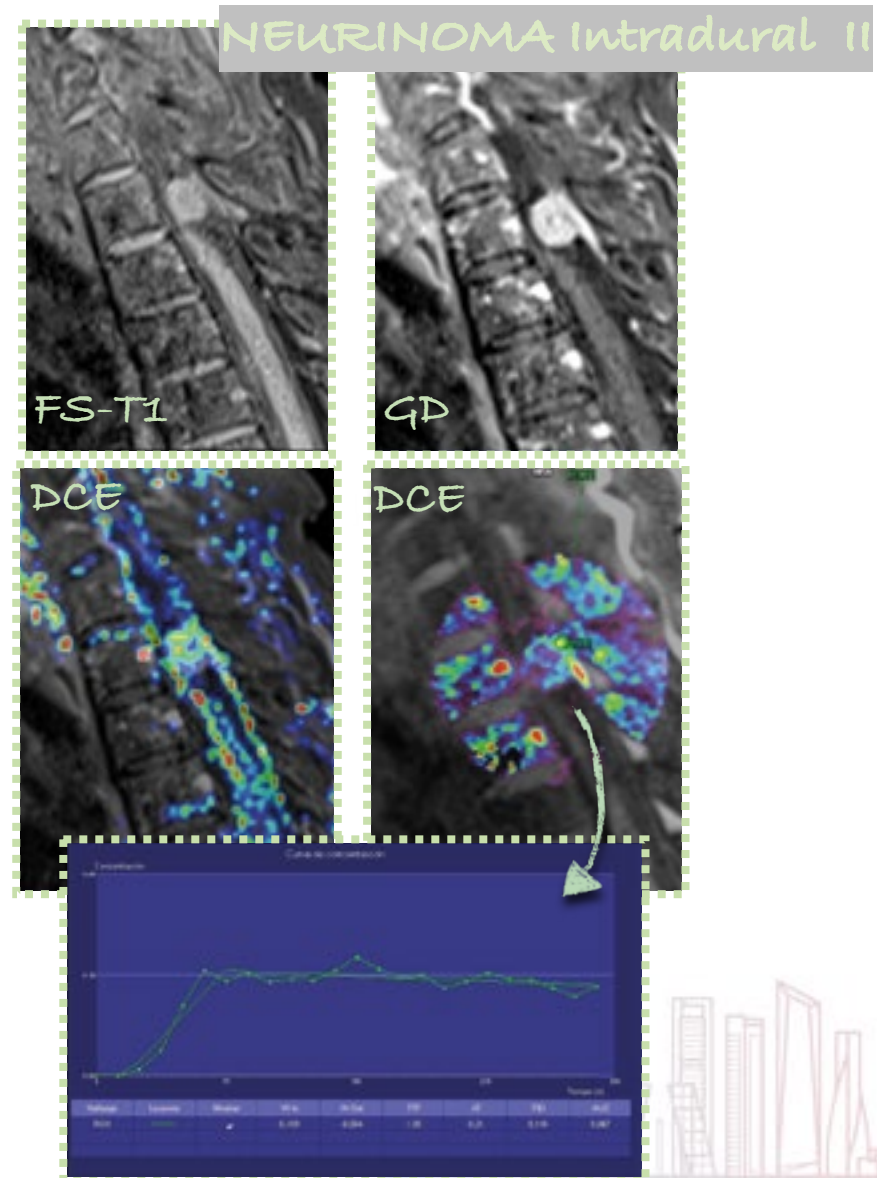
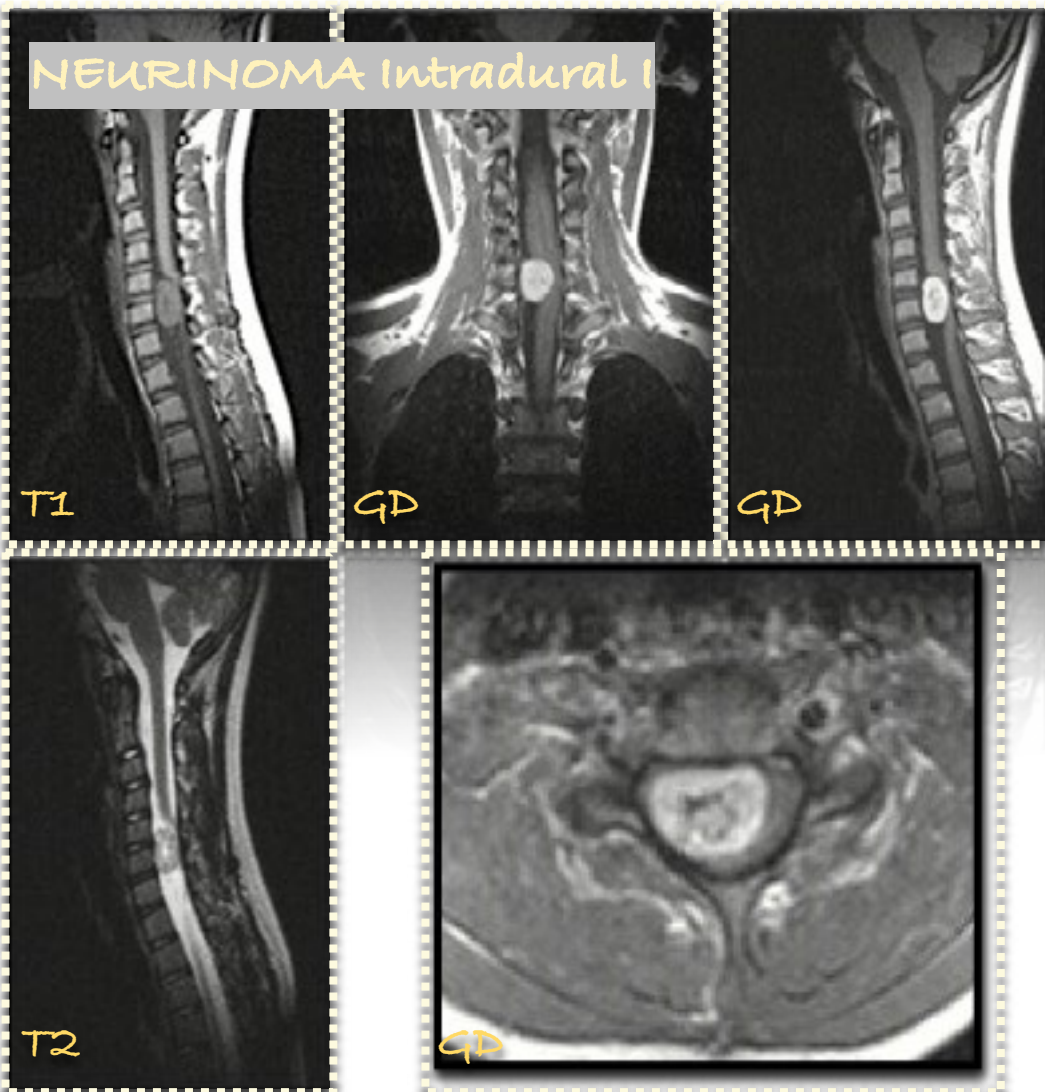
(inflamatorias, mecánicas - Q, tumorales - linfoma, Mtx...)

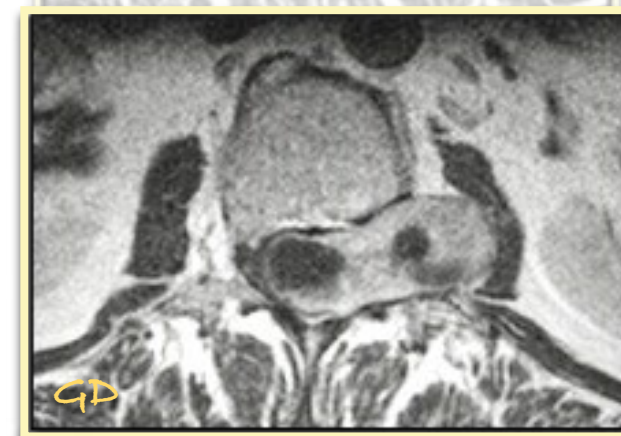
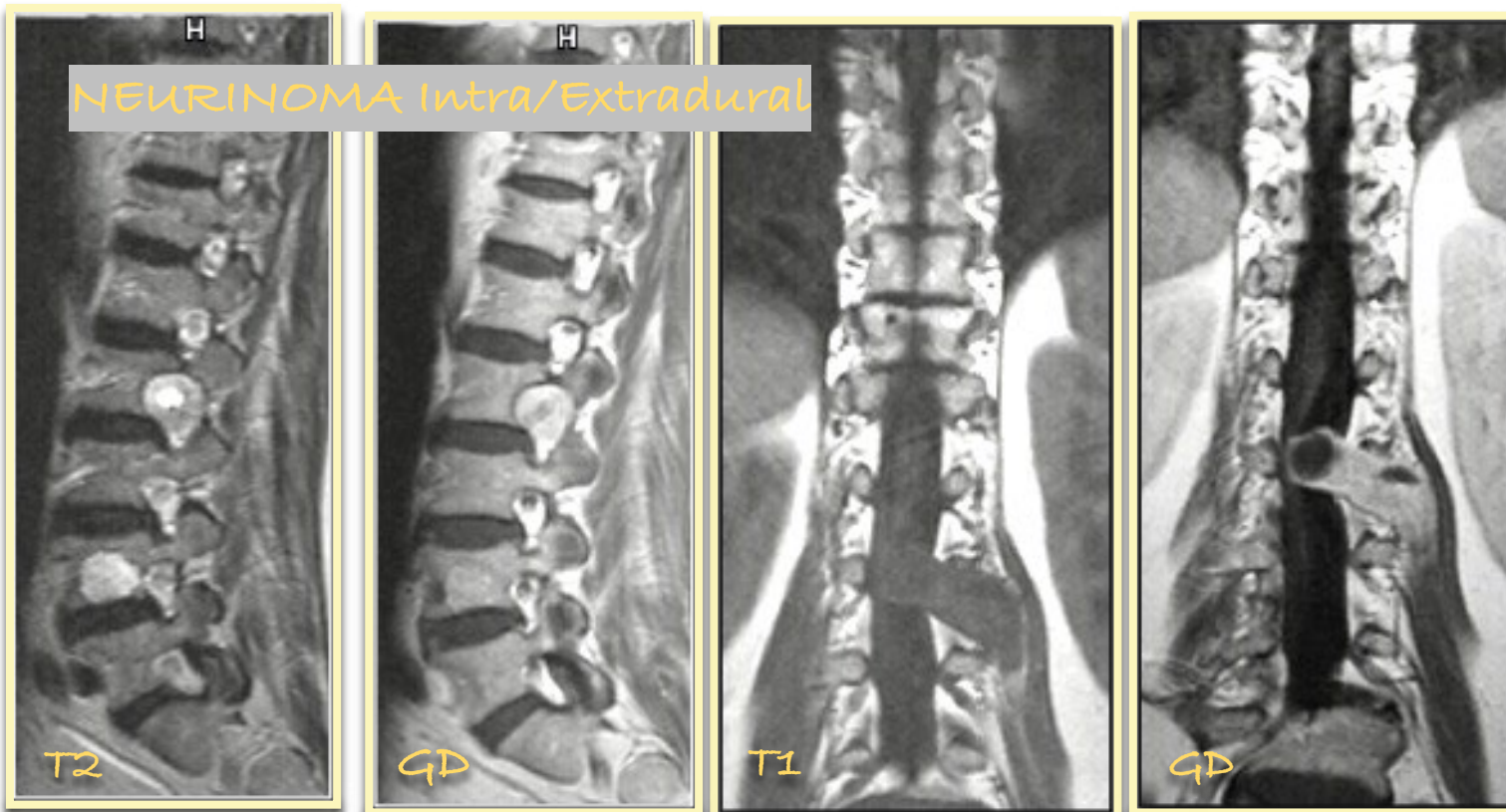
EXTRADURALES: CORDOMA, EPENDIMOMA, GANGLIÓN







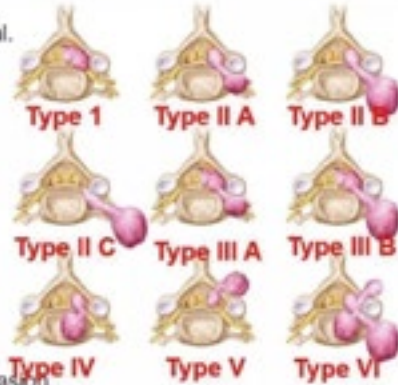




CLASIFICACIÓN NEURINOMAS CERVICALES

Asazuma Classification of spinal cord Schwannomas

- **Type I**
 - Intradural extradural restricted to the spinal canal.
 - The constriction occurs at the dura.
- **Type II**
 - Are all extradural, and are subclassified as:
 - IIa do not expand beyond the neural foramen.
 - IIb inside spinal canal + paravertebral.
 - IIc foraminal + paravertebral.
- **Type III**
 - IIIa are intradural and extradural foraminal,
 - IIIb are intradural and extradural paravertebral.
- **Type IV**
 - Are extradural and intravertebral.
- **Type V**
 - Are extradural and extralaminar with laminar invasion.
- **Type VI**
 - Show multidirectional bone erosion.
- **Craniocaudal spread:**
 - IF & TF designate the number of intervertebral foramina and transverse foramina involved, respectively (e.g. IF stage 2 = 2 foramina).
 - Schwannomas involving C1 & C2: May involve vertebral arteries and require additional caution.

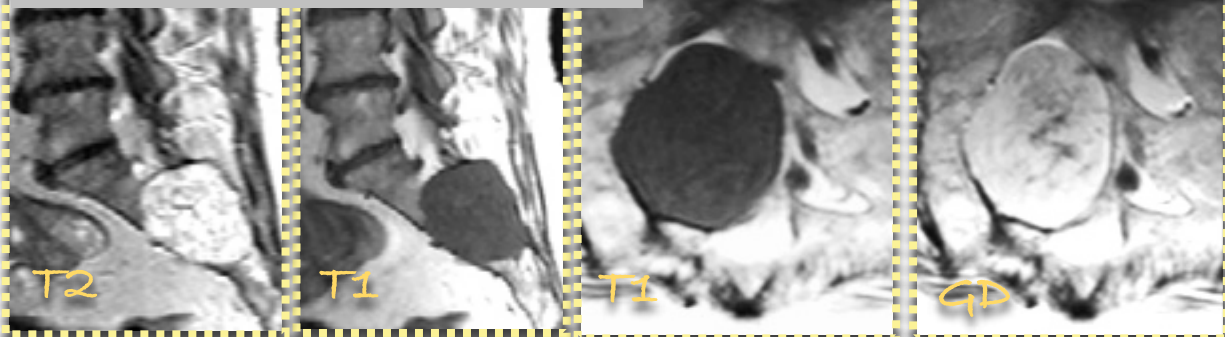


ASAZUMA ET AL/SPINE/2004

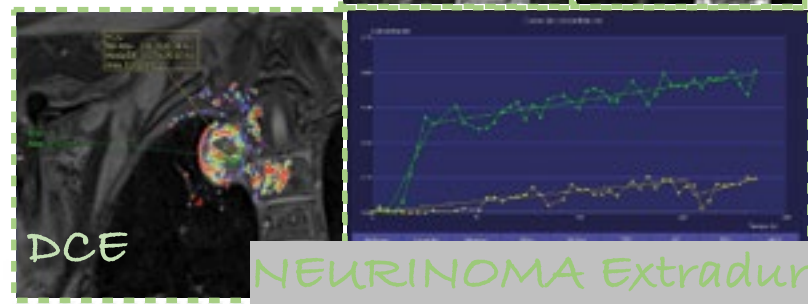
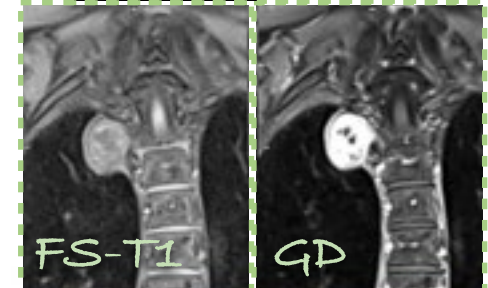
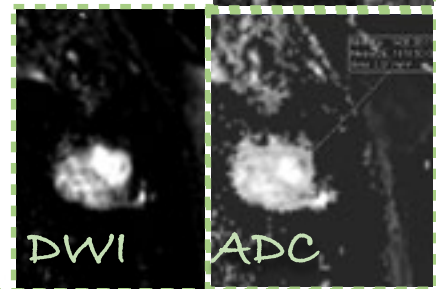
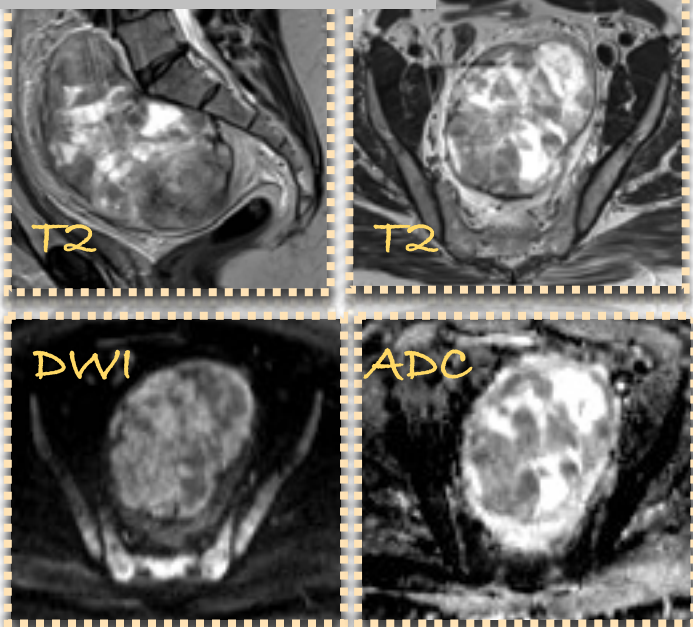
17th OCT 2021/BRAIN



NEURINOMA Extradural I

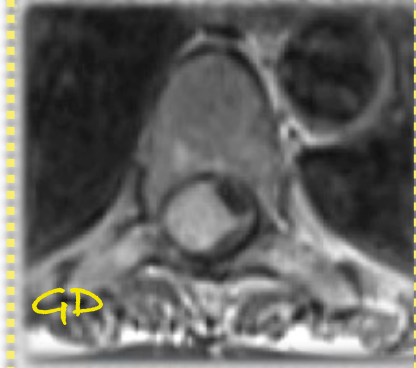


NEURINOMA Extradural II

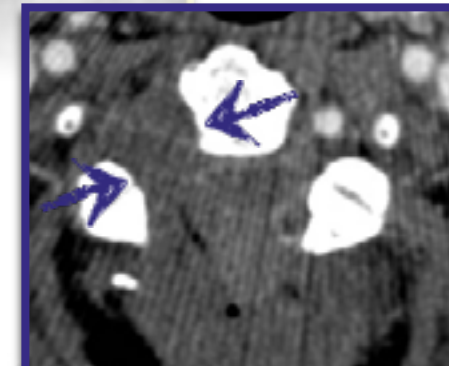
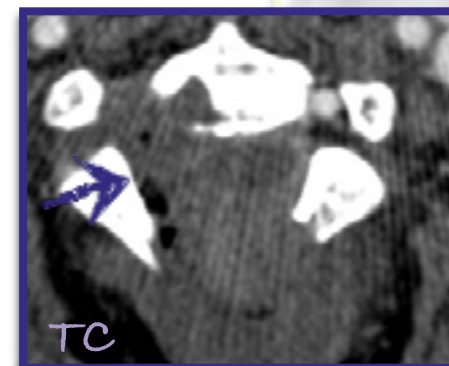
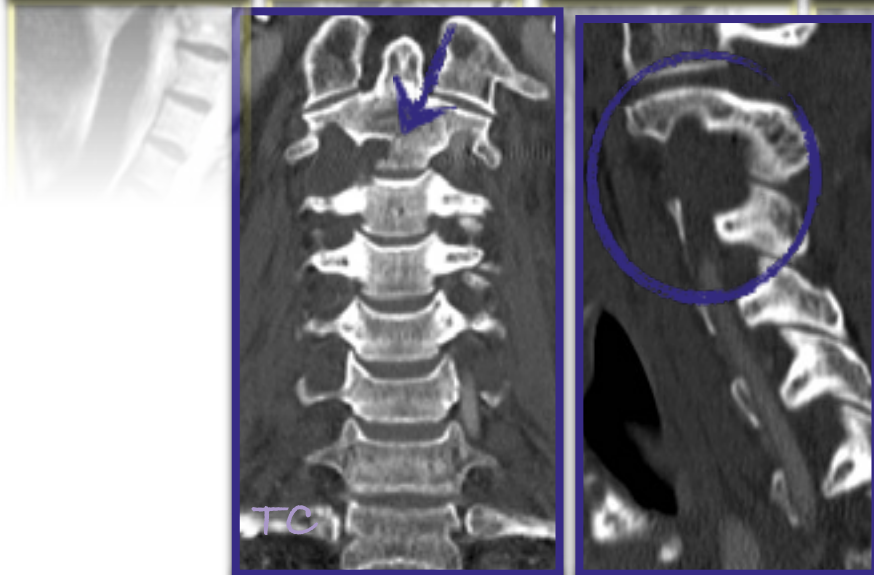
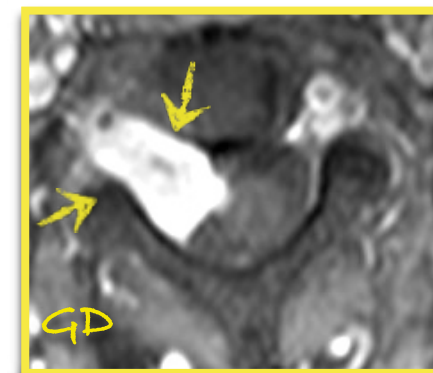
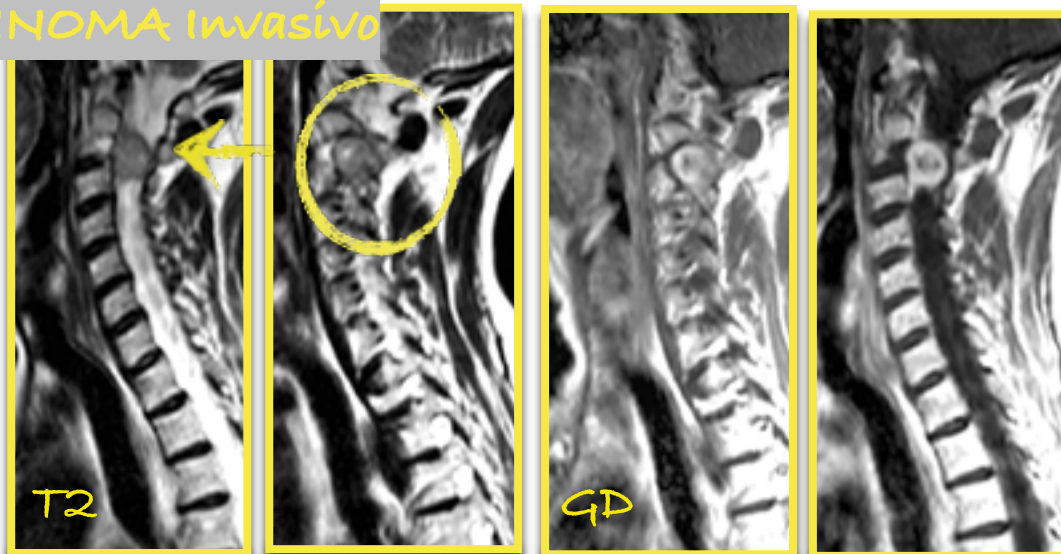


NEURINOMA Extradural III

NEURINOMA quístico

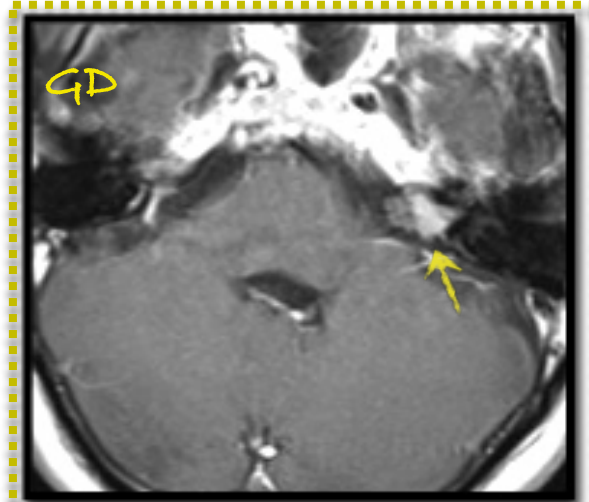


NEURINOMA INVASIVO



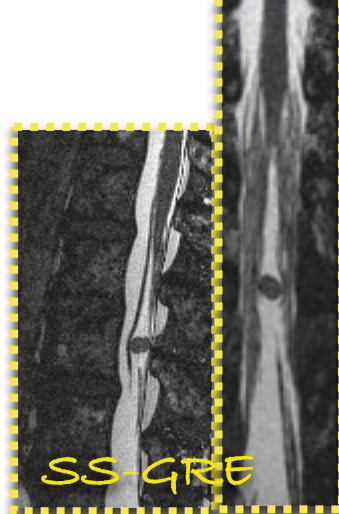
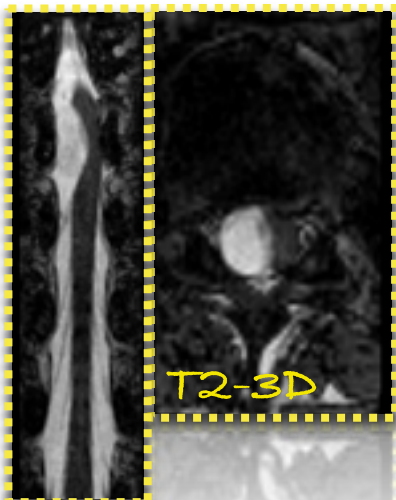
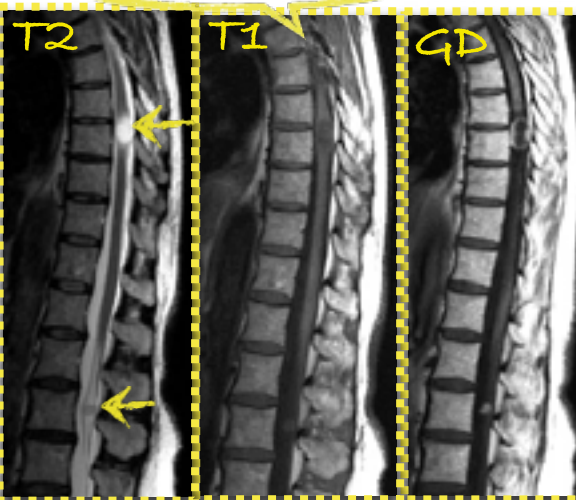


NF II
Ependimomas - T. vainas nerviosas múltiples

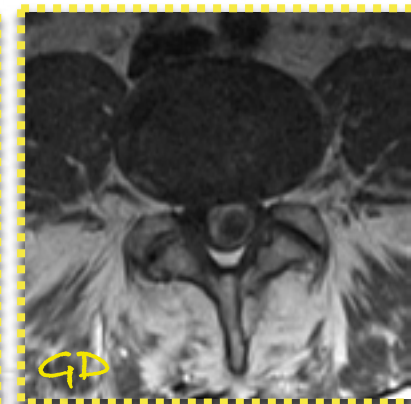
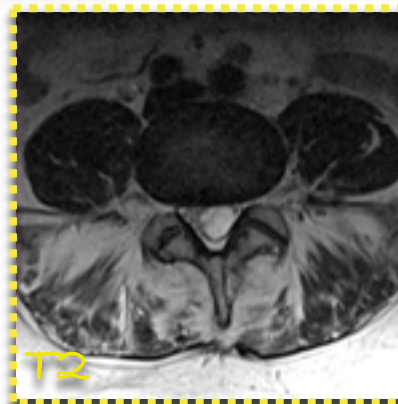
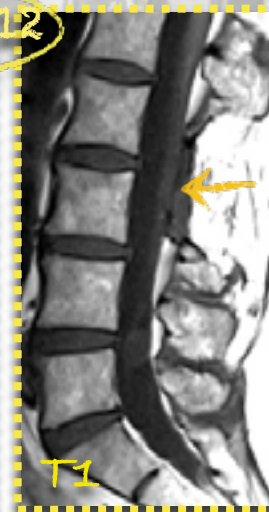
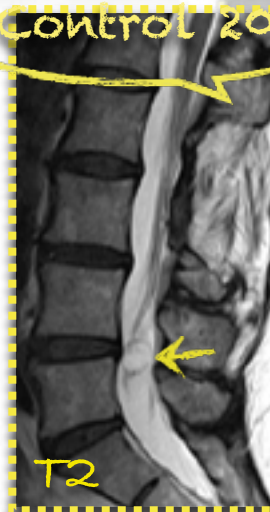


1º Estudio 2006

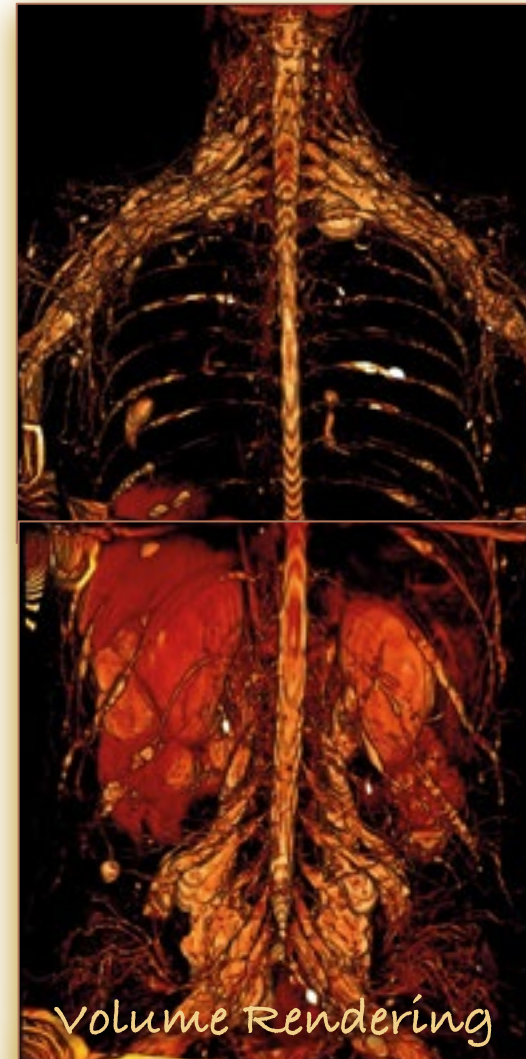
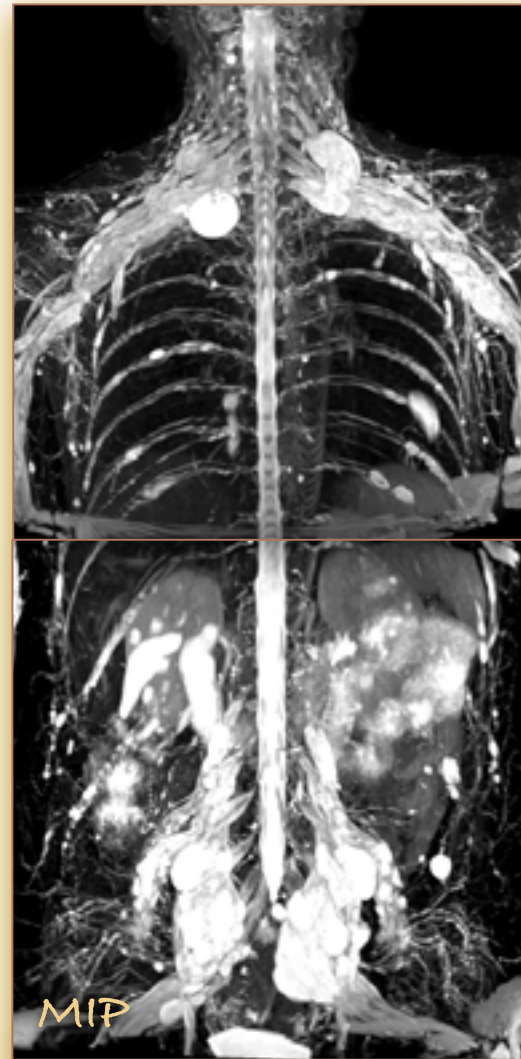
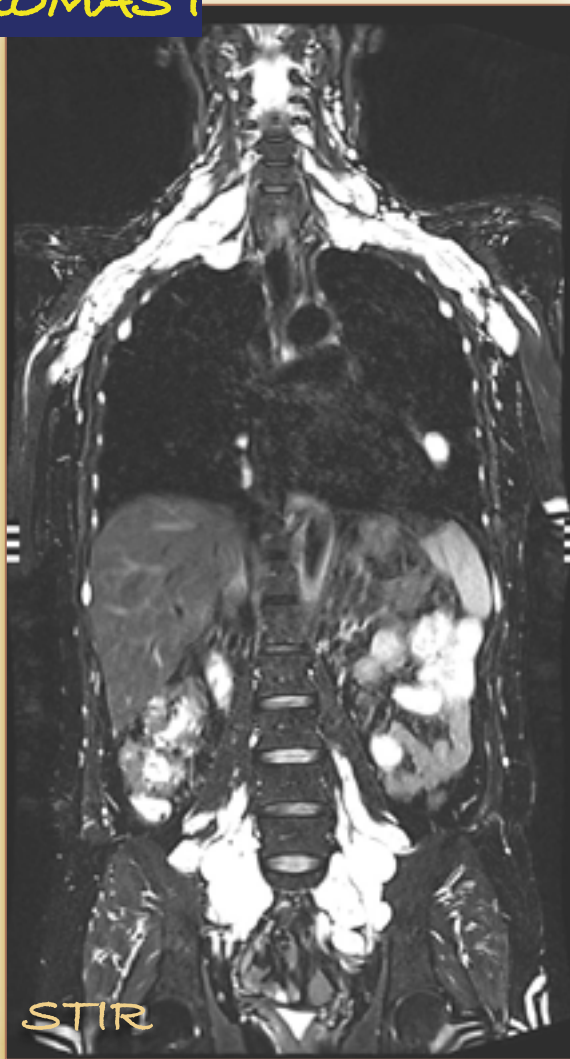
SCHWANNOMATOSIS FAMILIAR



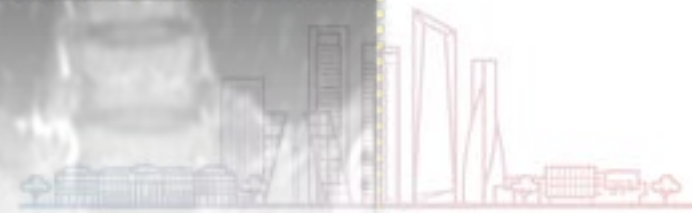
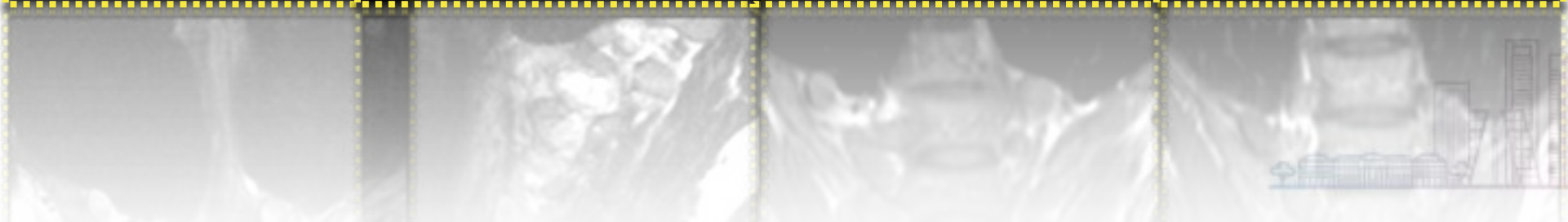
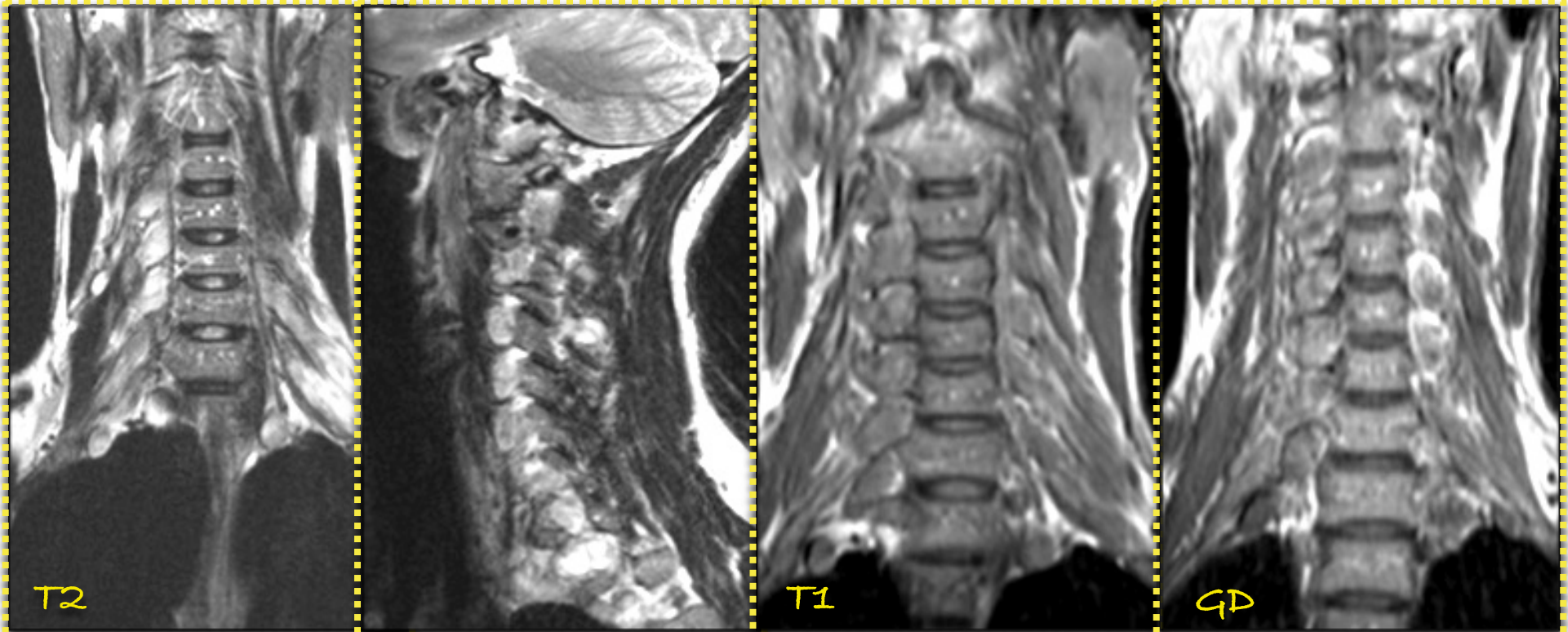
Control 2012



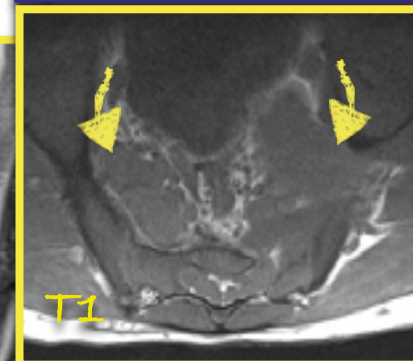
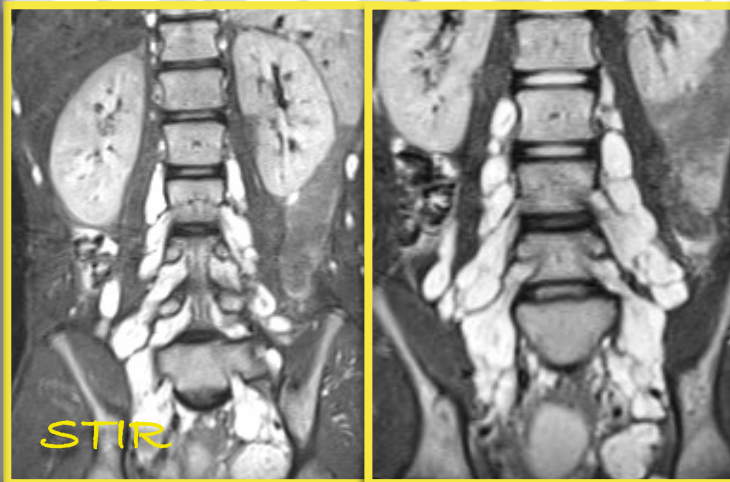
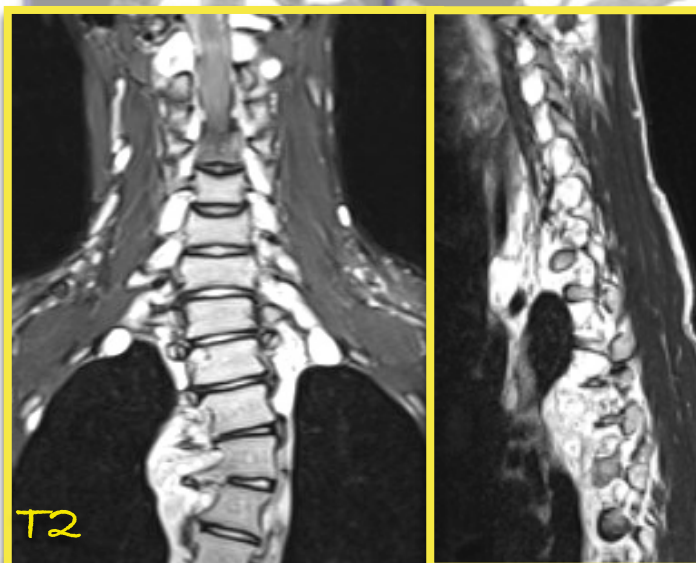
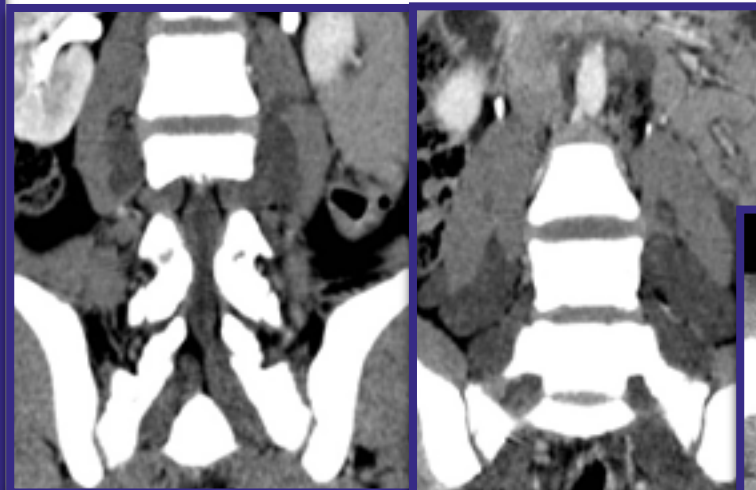
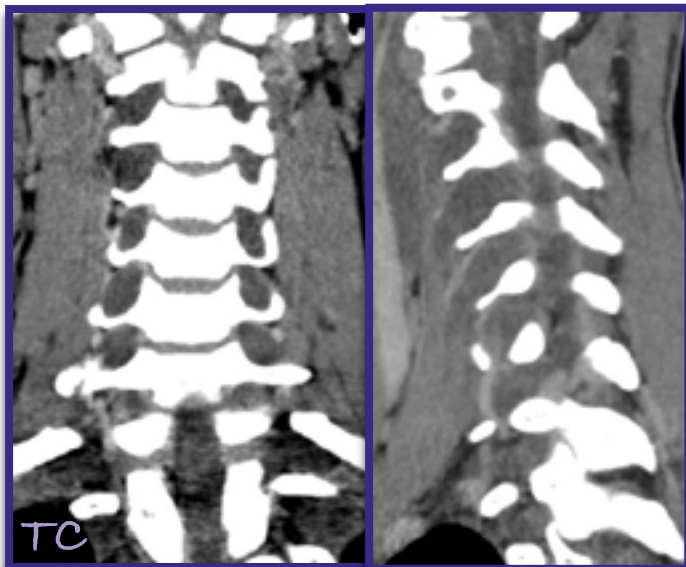
NEUROFIBROMAS I



NEUROFIBROMAS II

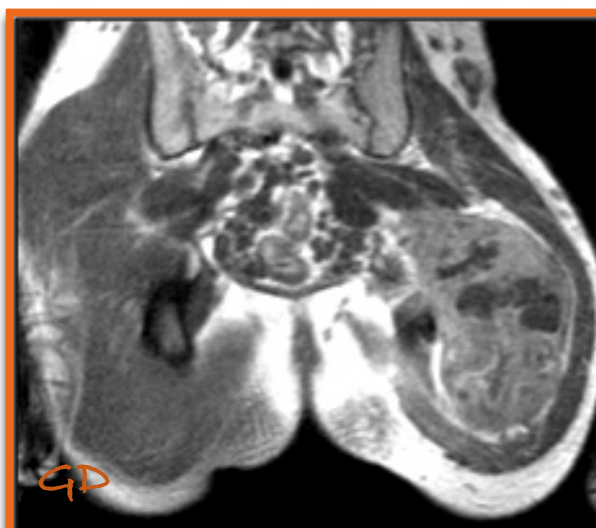
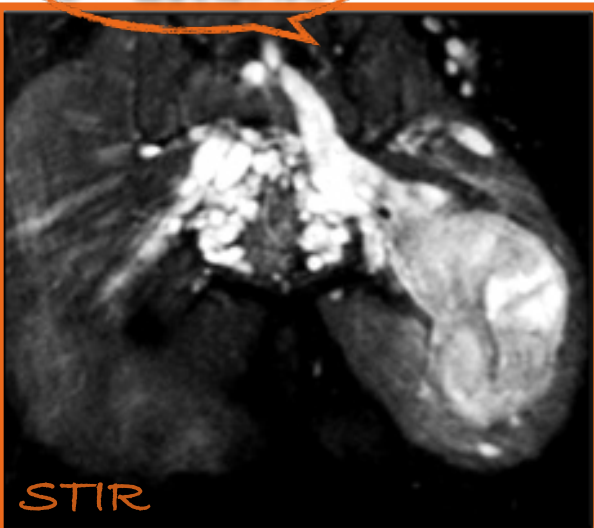


NEUROFIBROMAS III

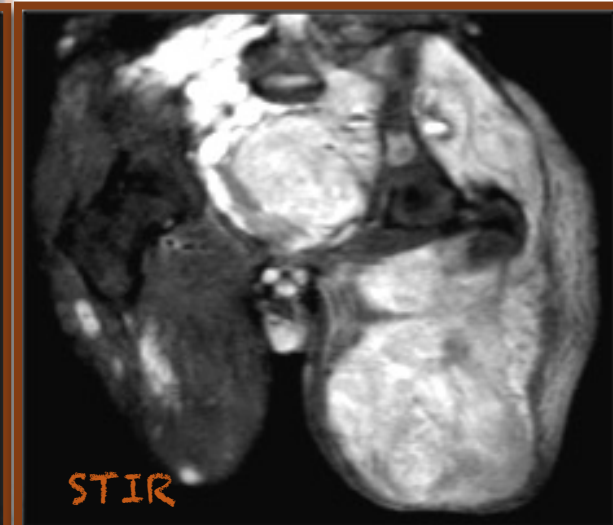
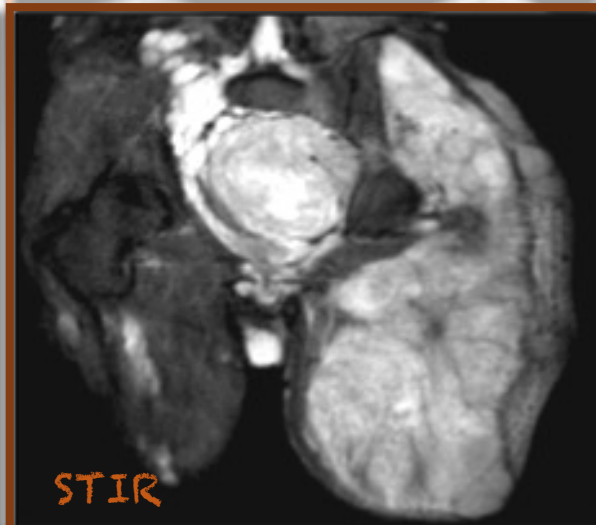


1º Estudio

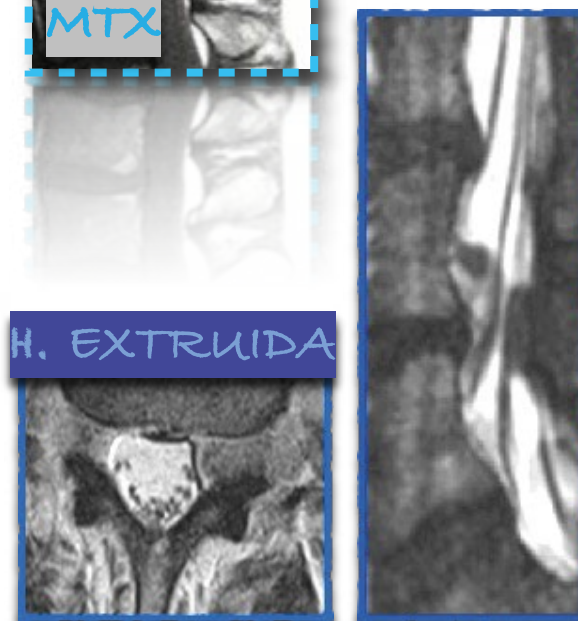
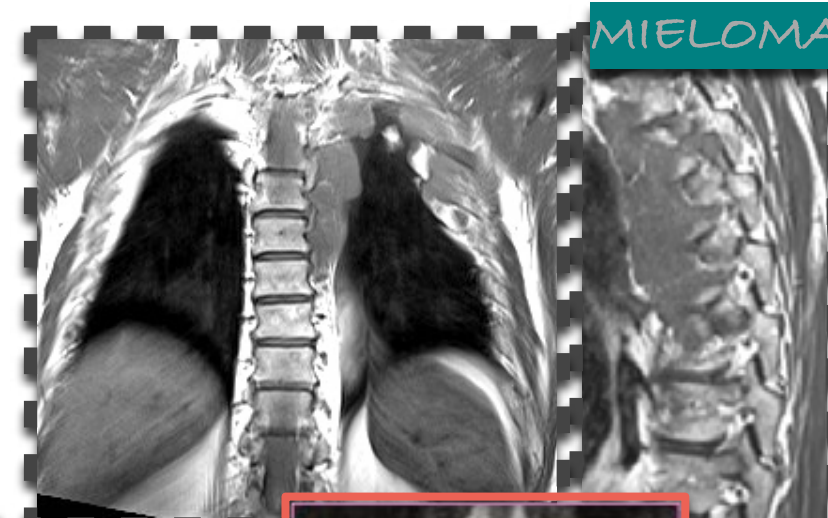
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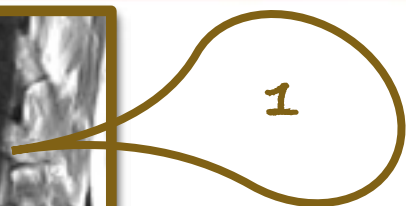
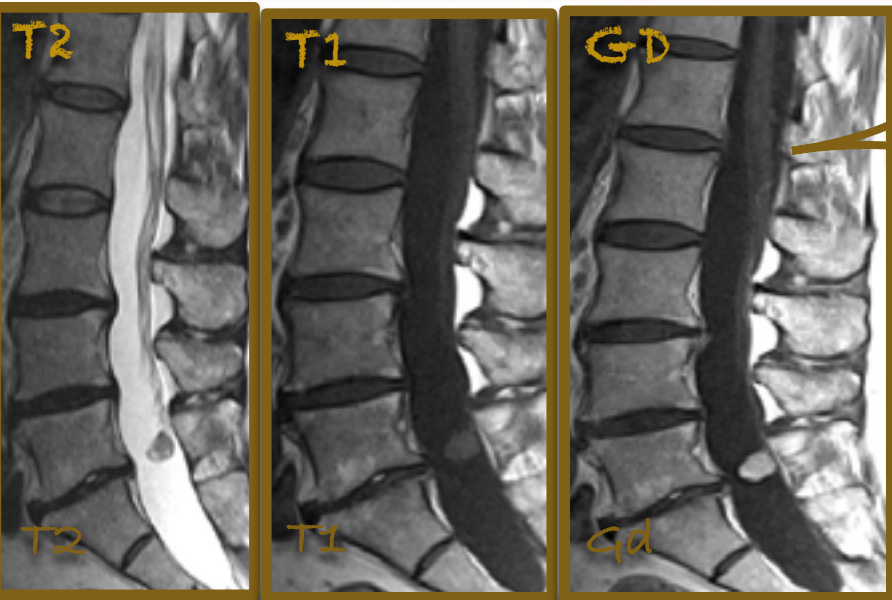


Control 1 año

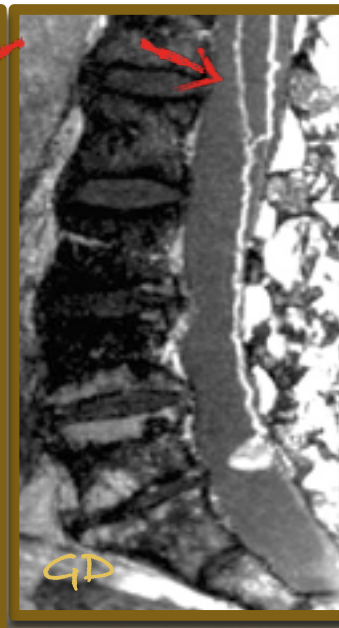
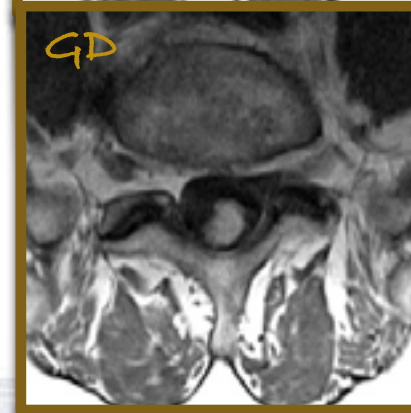
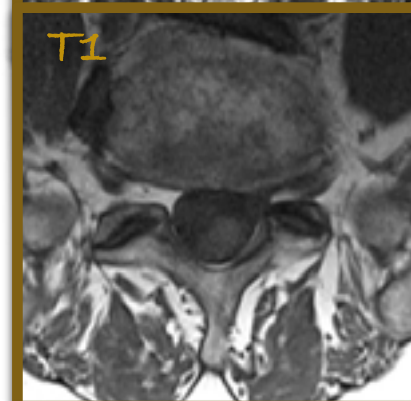


DIAGNÓSTICO DIFERENCIAL



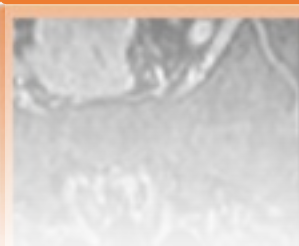
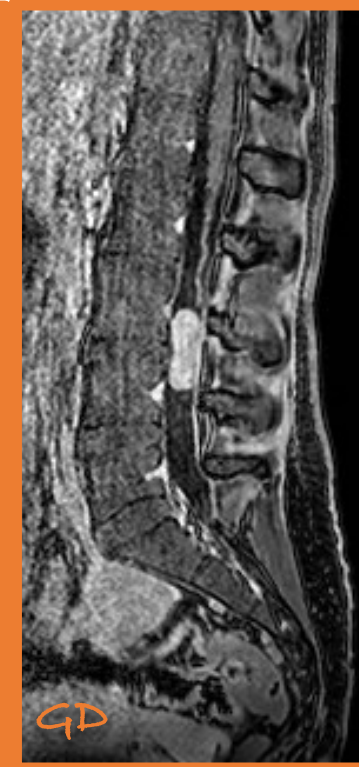
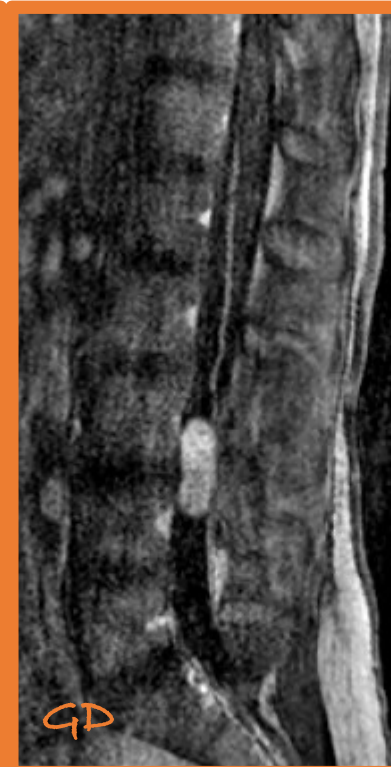
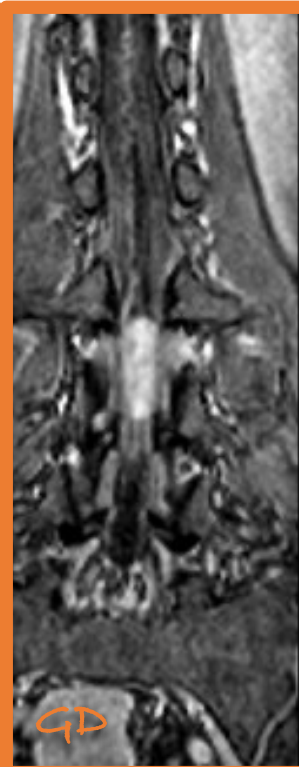


PARAGANGLIOMAS



Volume Rendering

2



5%

METÁSTASIS

Raras. Pronóstico malo

Rg. Lumbosacra.

Carcinomatosis leptomenígea - diseminación por esp. subaracnoideo

➔ Más frecuentes 2ª T. endocraneales niños (GBM, Meduloblastoma, ependimoma...)

➔ Diseminación hematogena - adenoca. (pulmón, mama), linfoma, leucemia..

R.M.: Sin cte. pueden pasar desapercibidas

Con cte. más ss. que citol. LCR

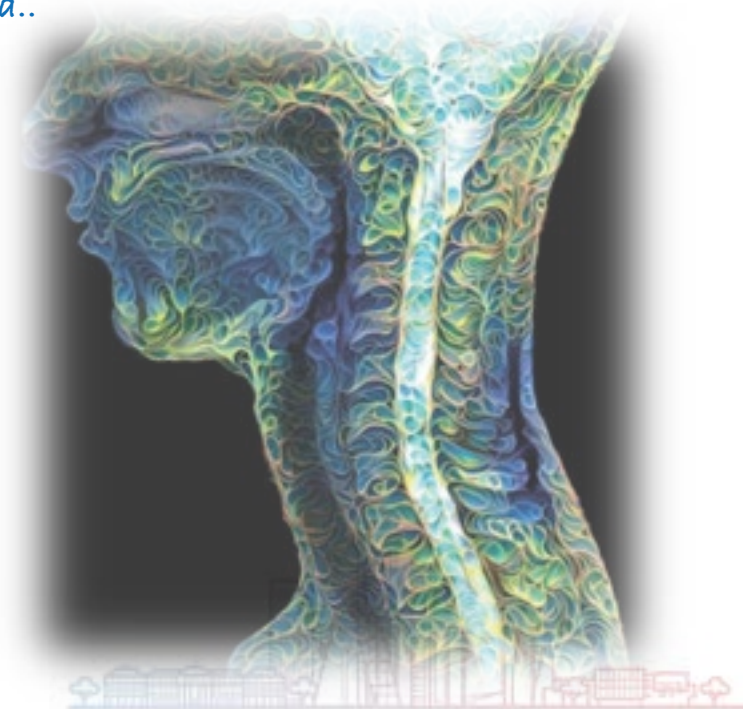
Masa solitaria / Nódulos en cono o en superficie medular

Engrosamiento difuso raíces / cono / superf. medular

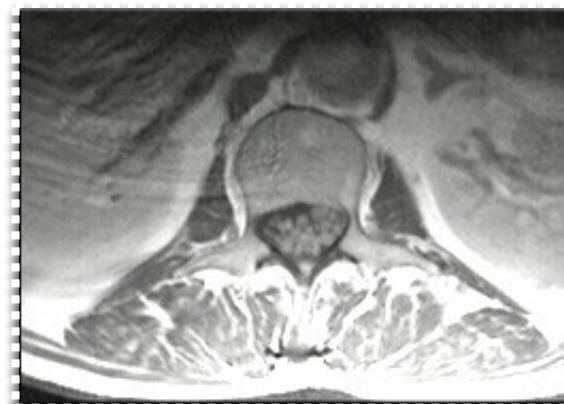
D.D.:

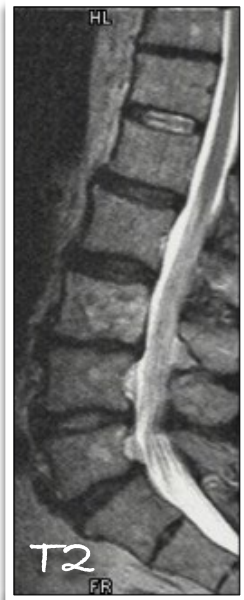
HEMANGIOBLASTOMA; MENINGITIS (BACTERIANA, POSTQ.)

QUILLAIN-BARRÉ; POLIRADICULOPATIAS CONGÉNITAS...



1

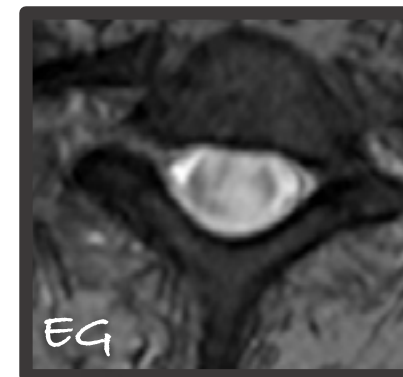




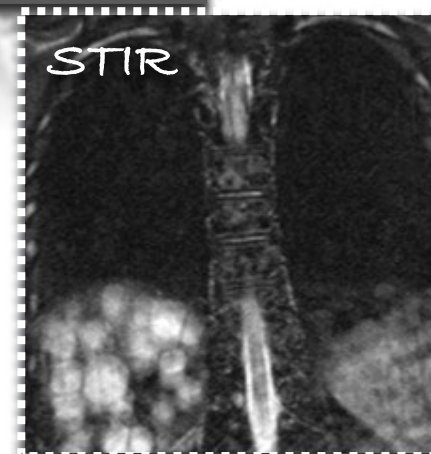
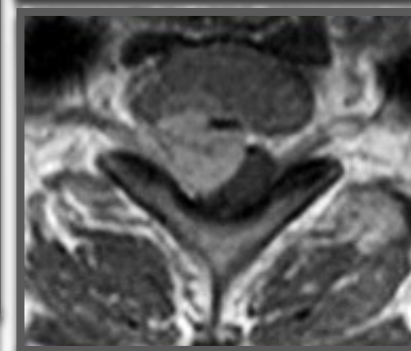
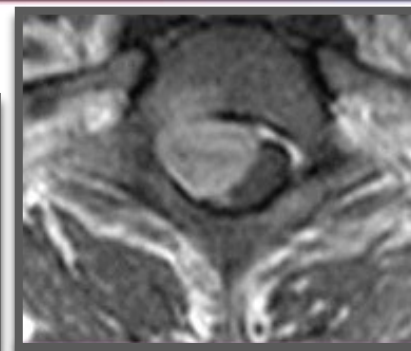
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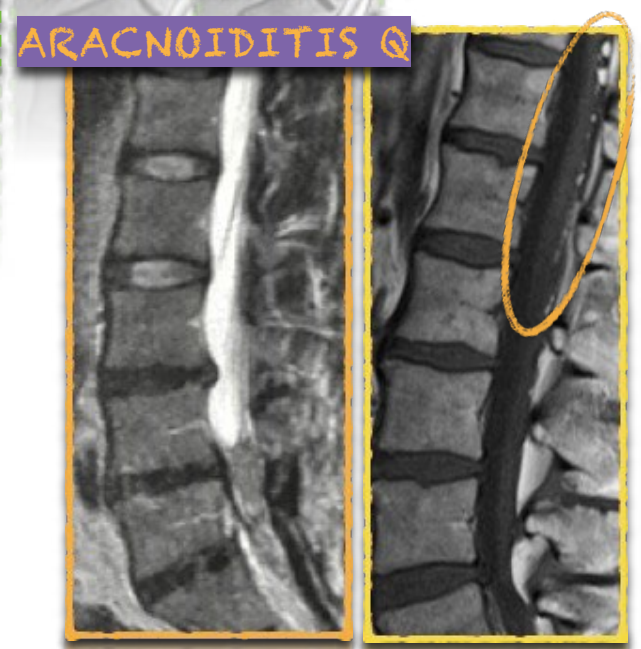
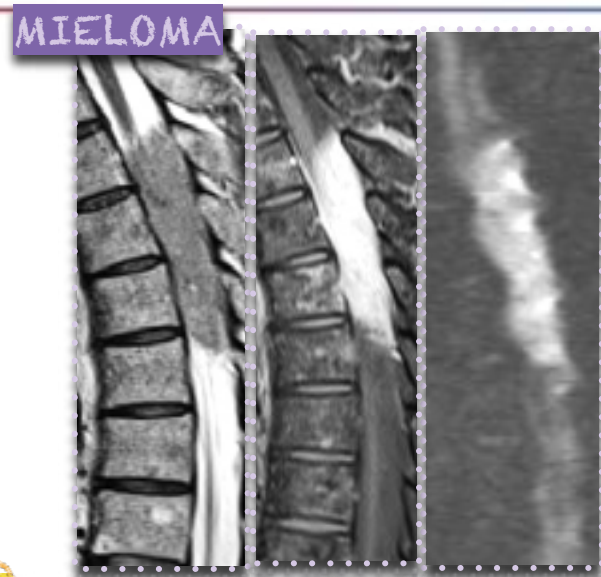
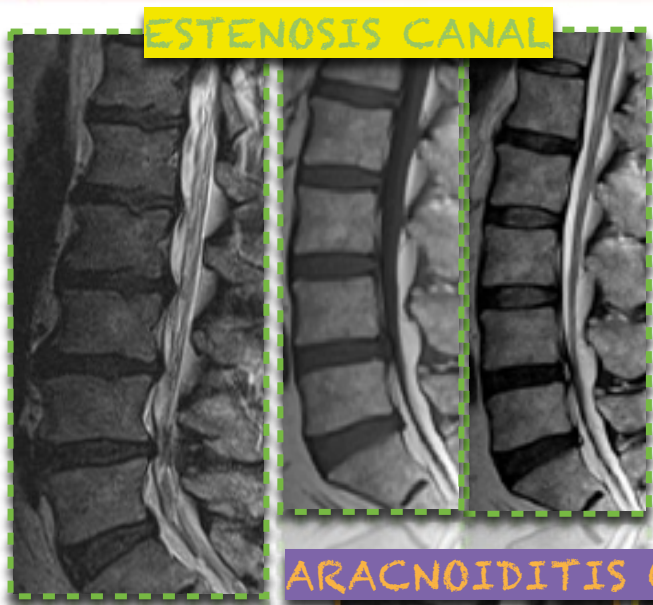


3



4







< 1%

MASAS CONGÉNITAS / del DESARROLLO

LIPOMA

LIPOMA del FILUM TERMINAL / LIPOMA INTRADURAL / LIPOMIELOMENINGOCELE

Inclusión MESODÉRMICA.

Asociados a Disrafismos

Mas frec. intradurales, tb extra o mixtos

Pueden adherirse a meninges, médula o raíces cola caballo (médula anclada)

En filum terminal, entre cola caballo, masa en rg. posterolateral de médula o en díastematomelia asociado a excrecencia ósea

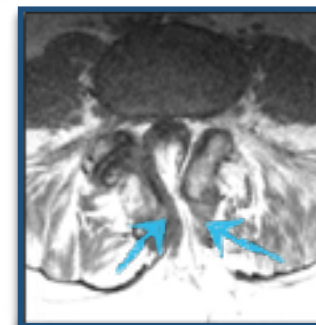
LIPOMA del FILUM TERMINAL

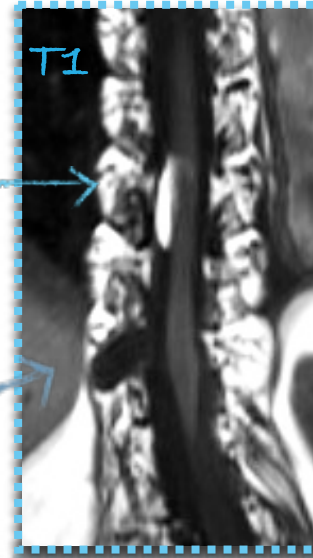
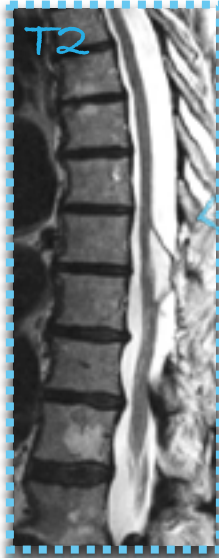


LIPOMA INTRADURAL

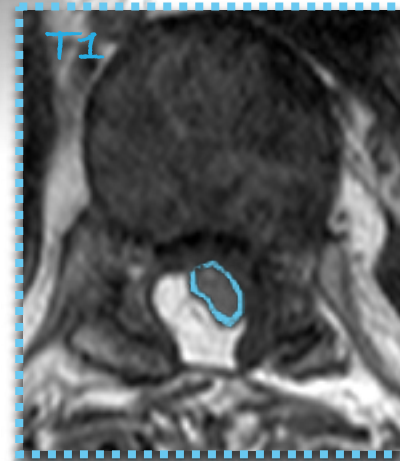


LIPOMIELOMENINGOCELE





LIPOMA
QUISTE MENÍNGEO



LIPOMA INTRADURAL



< 1%

MASAS CONGÉNITAS / del DESARROLLO

DERMOIDE / EPIDERMOIDE / TERATOMA

QUISTES DERMOIDE-EPIDERMOIDE: Inclusión ECTODÉRMICA.
TERATOMA: Tumor disembriógénico (3 capas)

Asociados a disrafismos
Mas frec. en niños. Lento crecimiento.

Intradurales - Intramedulares - Extradurales

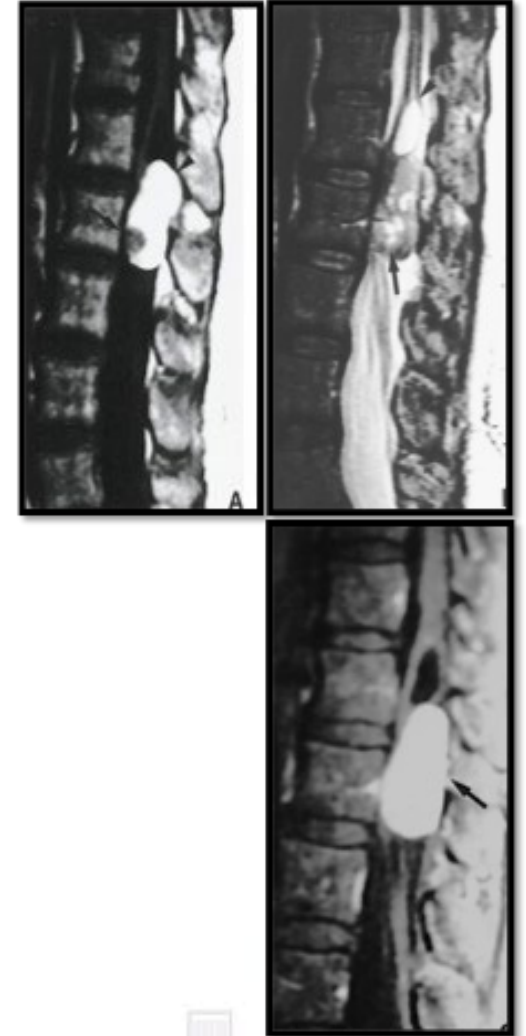
DERMOIDE - TERATOMA: Congénitos
EPIDERMOIDE: Congénito / adquirido

R.M.: variable, dependiendo capa embrionaria que derivan

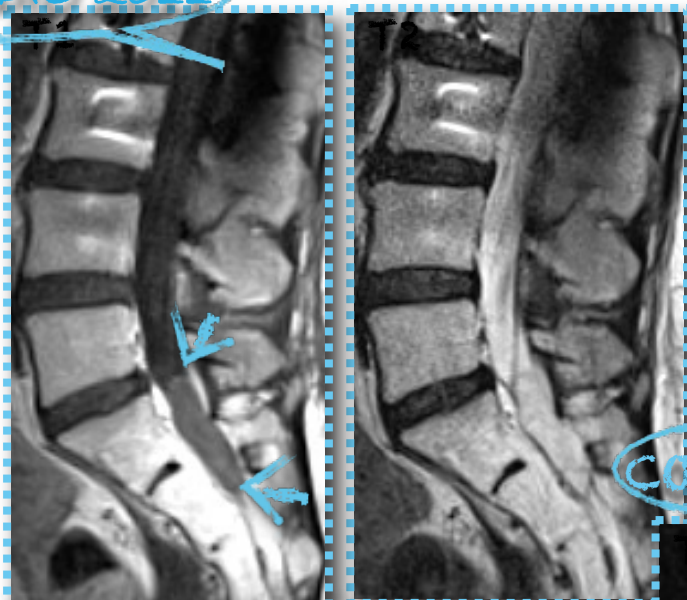
EPIDERMOIDE: Iso con LCR. DWI +

DERMOIDE: Señal heterogénea, hiper en T1

TERATOMA: Quistes complejos

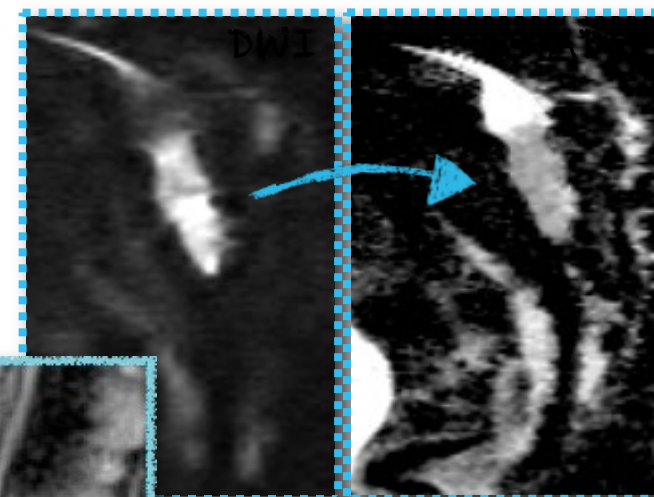
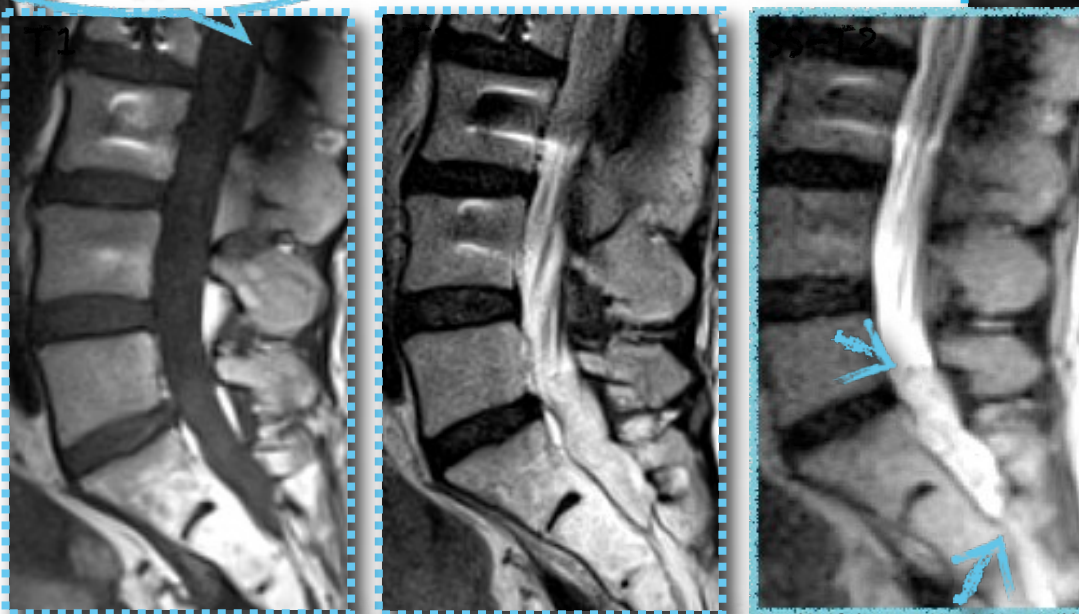


1º ESTUDIO 2011



QUISTE EPIDERMÓIDE PostQ

CONTROL 2012



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Gracias...

