How to evaluate a case with the INTERPRET DSS 3.0

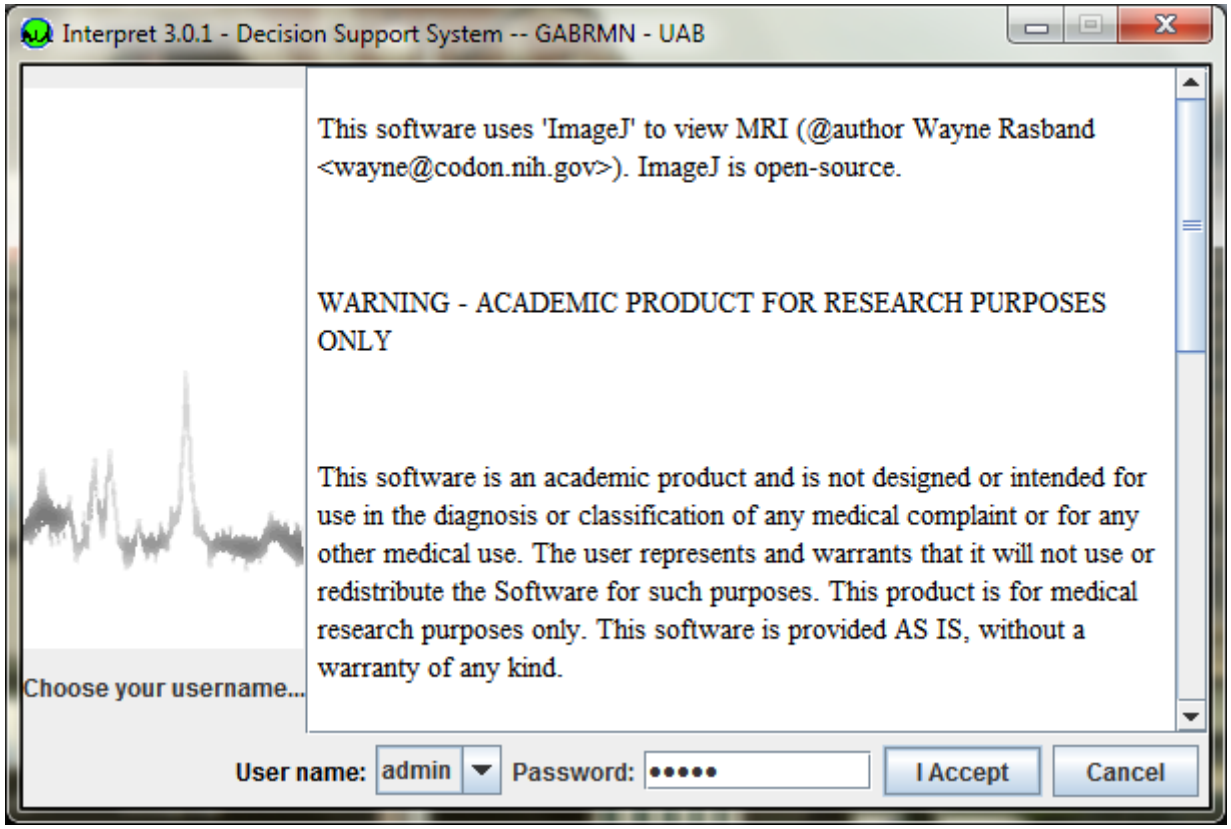
and SV MRS data from human brain tumours at 1.5 T

- A radiologist comes to us with the spectrum of an abnormal brain mass.

- The clinical presentation and the MRI shows reasonable suspicion that the abnormal mass can be either a low-grade glial tumor or a pseudotumoral mass (infarct, multiple sclerosis, abscess, etc).

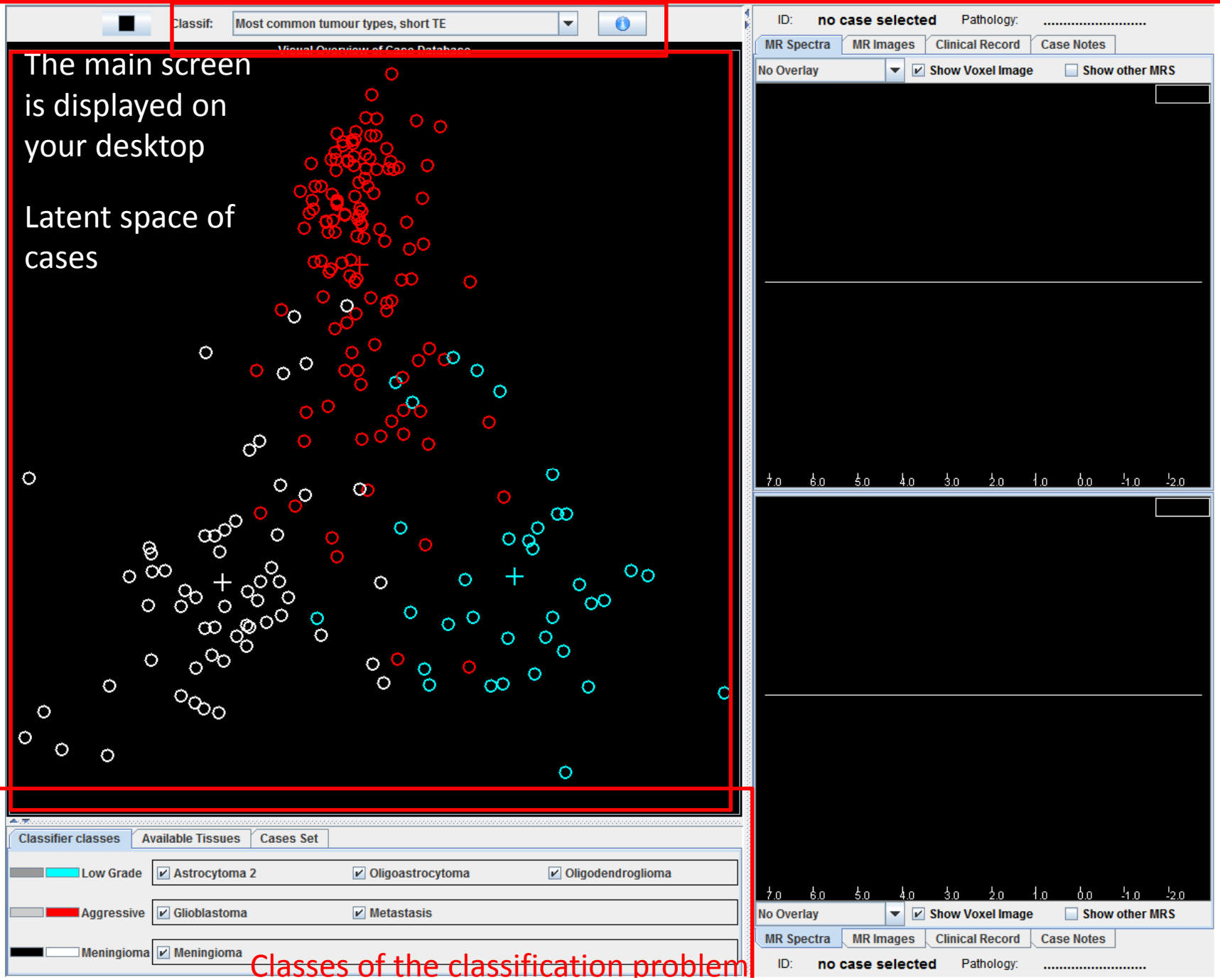
How do you evaluate the spectra of the case with the INTERPRET DSS?

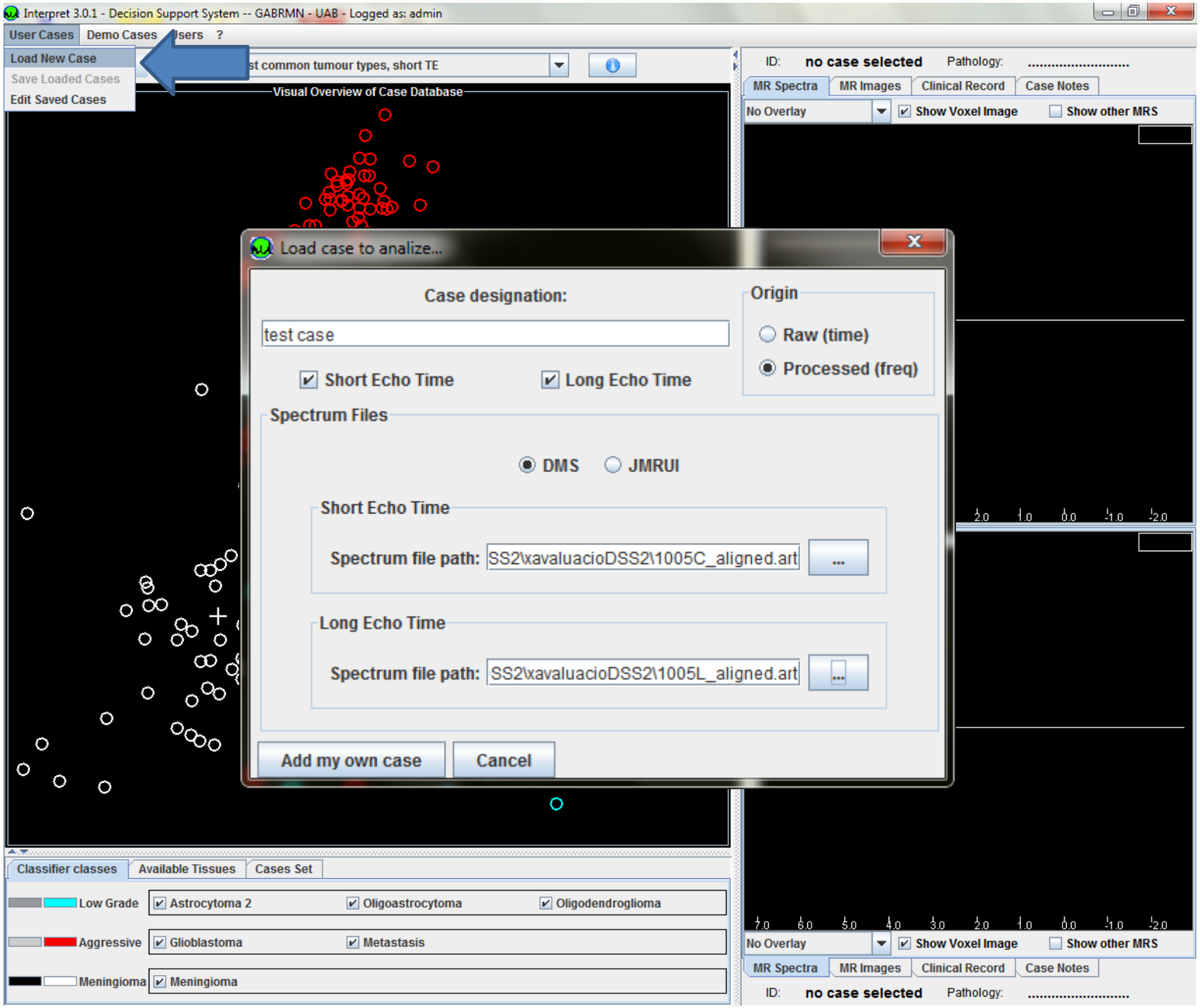
Double-click the DSS 3.0.2 icon on your desktop

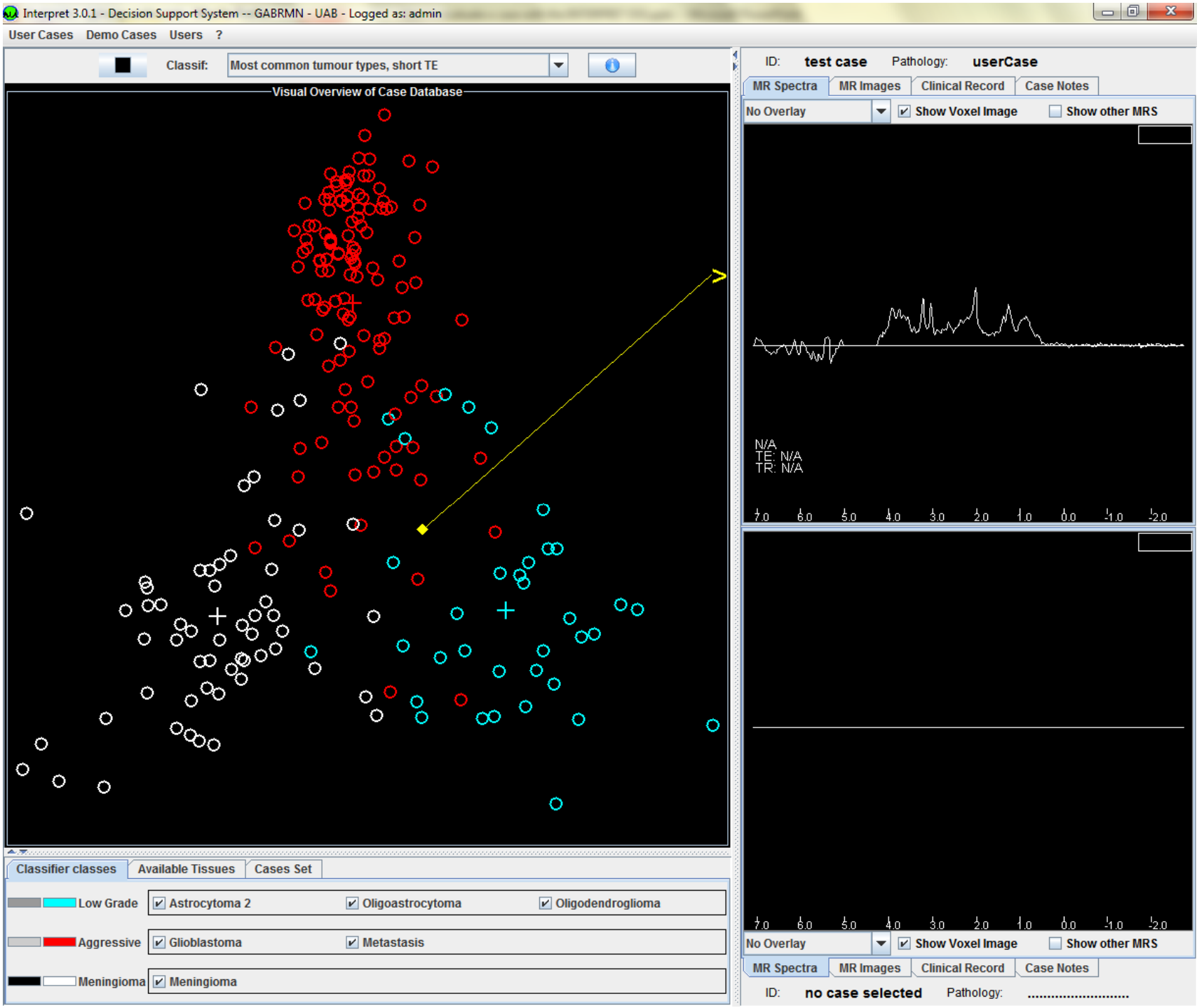


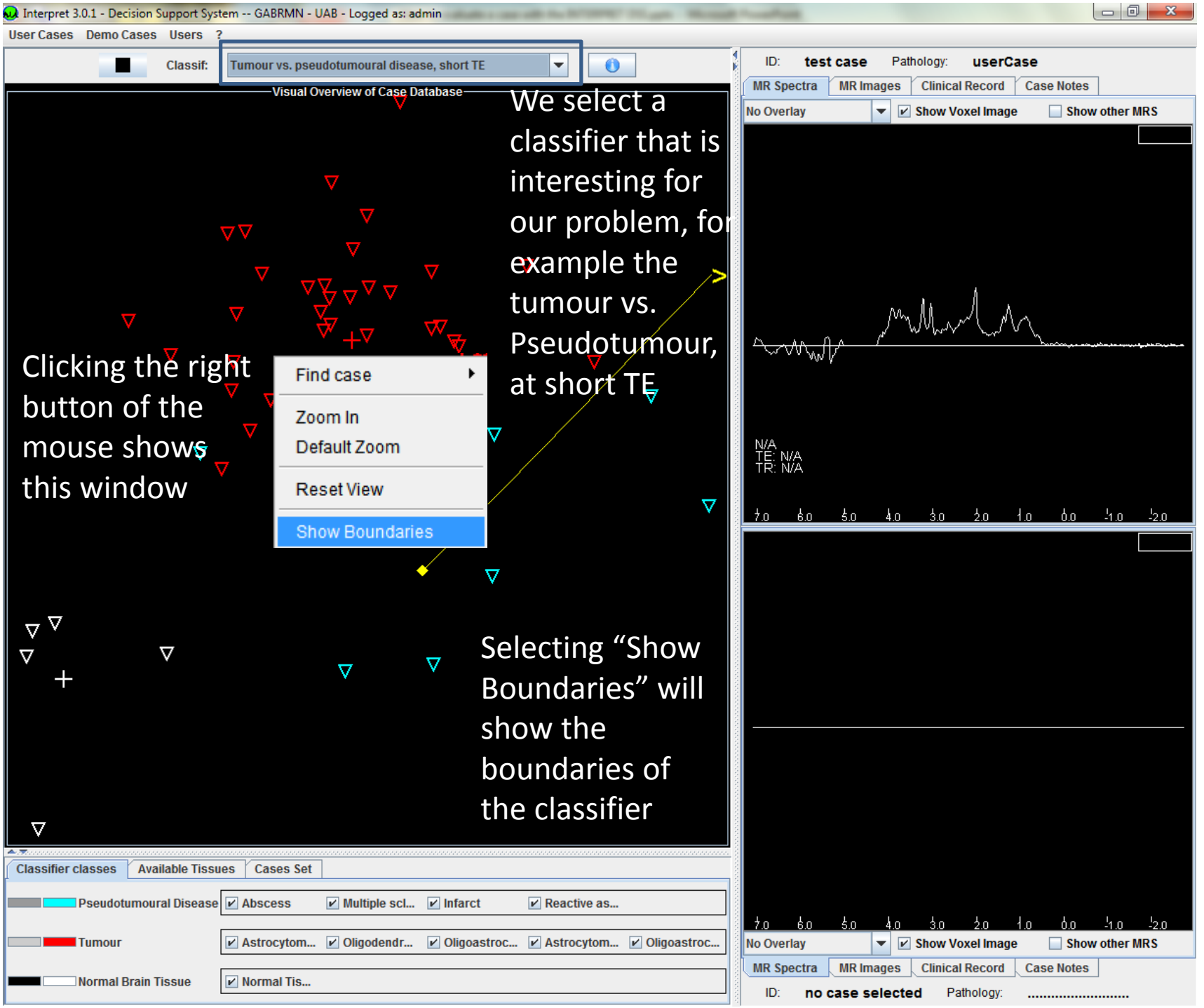
Enter the password and click accept

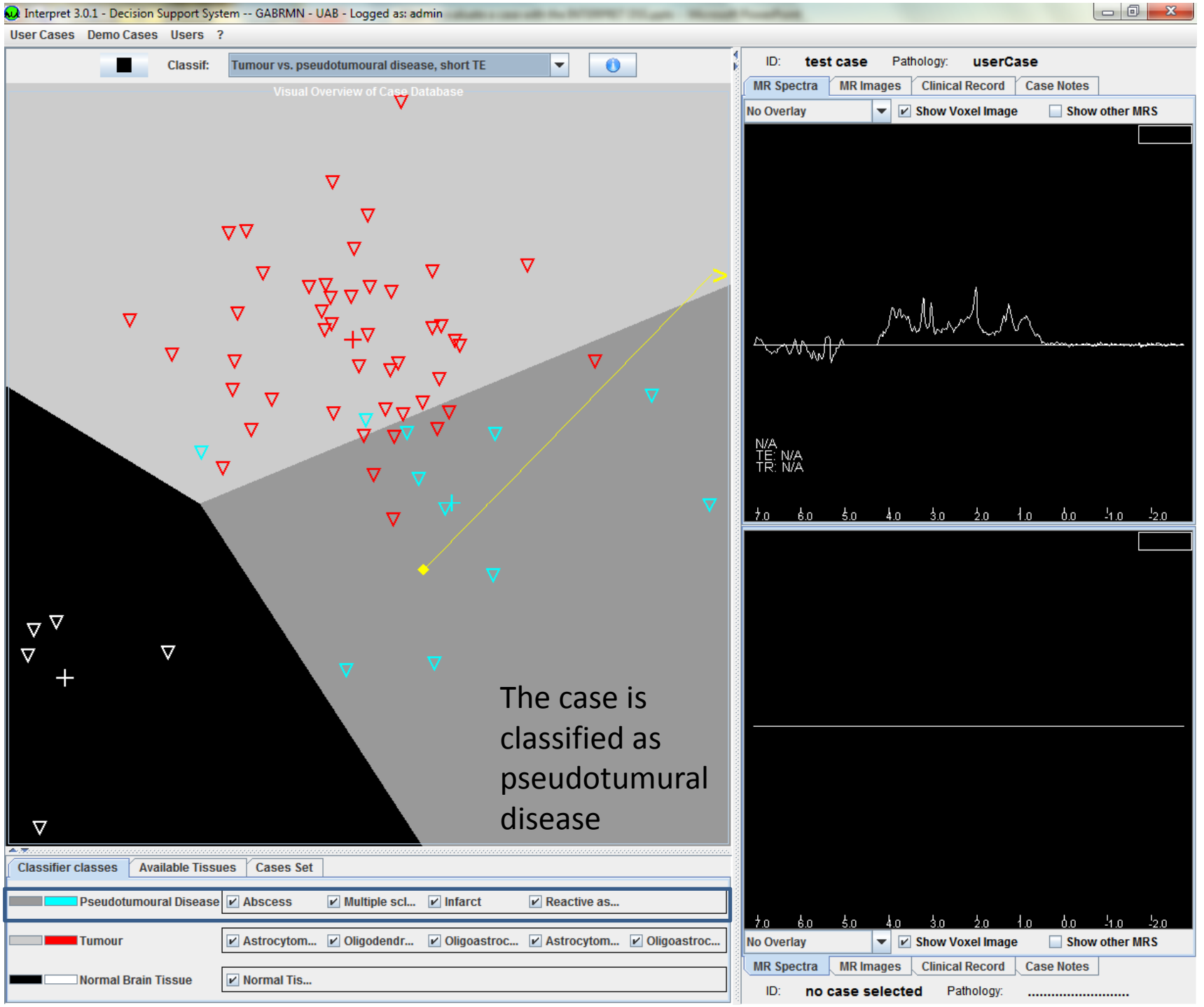
Menu where the classification problem is shown, here the “most common tumour types” with short TE spectra option selected

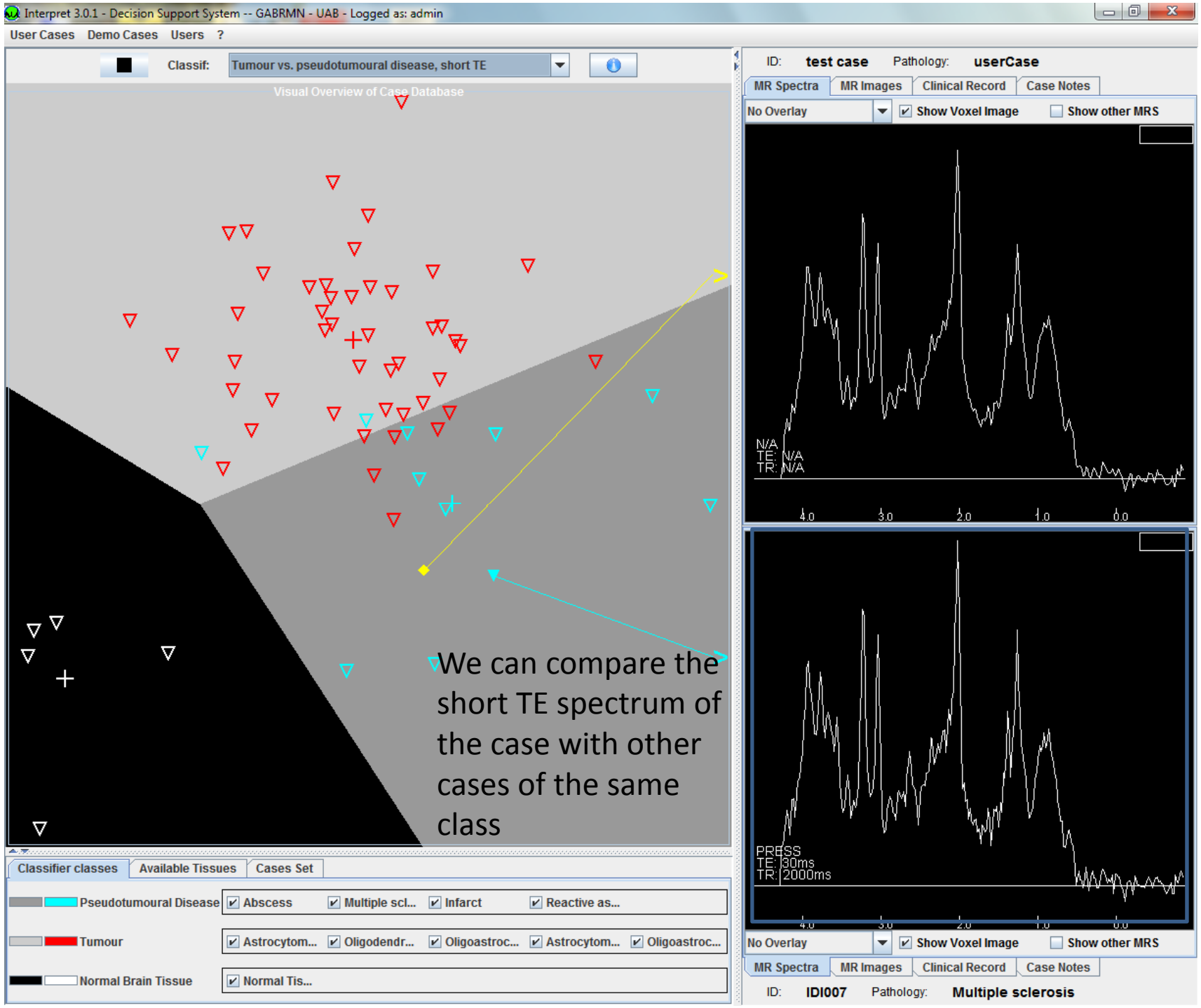


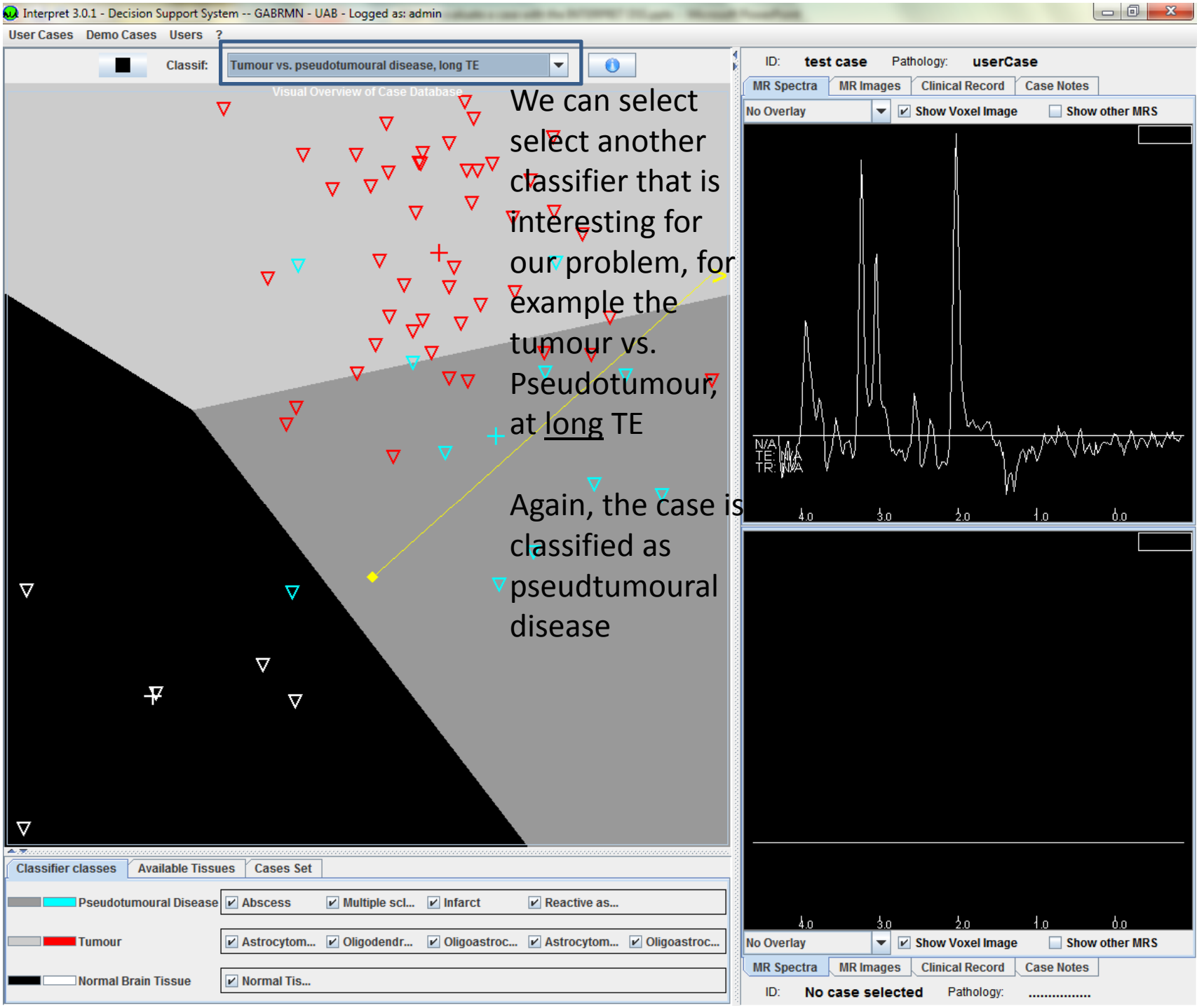

Interpret 3.0.1 - Decision Support System -- GABRMN - UAB - Logged as: admin
User Cases
Demo Cases
Users
?
Load New Case
Save Loaded Cases
Edit Saved Cases
st common tumour types, short TE
Visual Overview of Case Database
ID: no case selected
Pathology: .....
MR Spectra
MR Images
Clinical Record
Case Notes
No Overlay
Show Voxel Image
Show other MRS
Load case to analize...
Case designation:
test case
Short Echo Time
Long Echo Time
Origin
Raw (time)
Processed (freq)
Spectrum Files
DMS
JMRUI
Short Echo Time
Spectrum file path:
SS2\xavaluacioDSS2\1005C_aligned.art
...
Long Echo Time
Spectrum file path:
SS2\xavaluacioDSS2\1005L_aligned.art
...
Add my own case
Cancel
Classifier classes
Available Tissues
Cases Set
Low Grade
Astrocytoma 2
Oligoastrocytoma
Oligodendroglioma
Aggressive
Glioblastoma
Metastasis
Meningioma
Meningioma

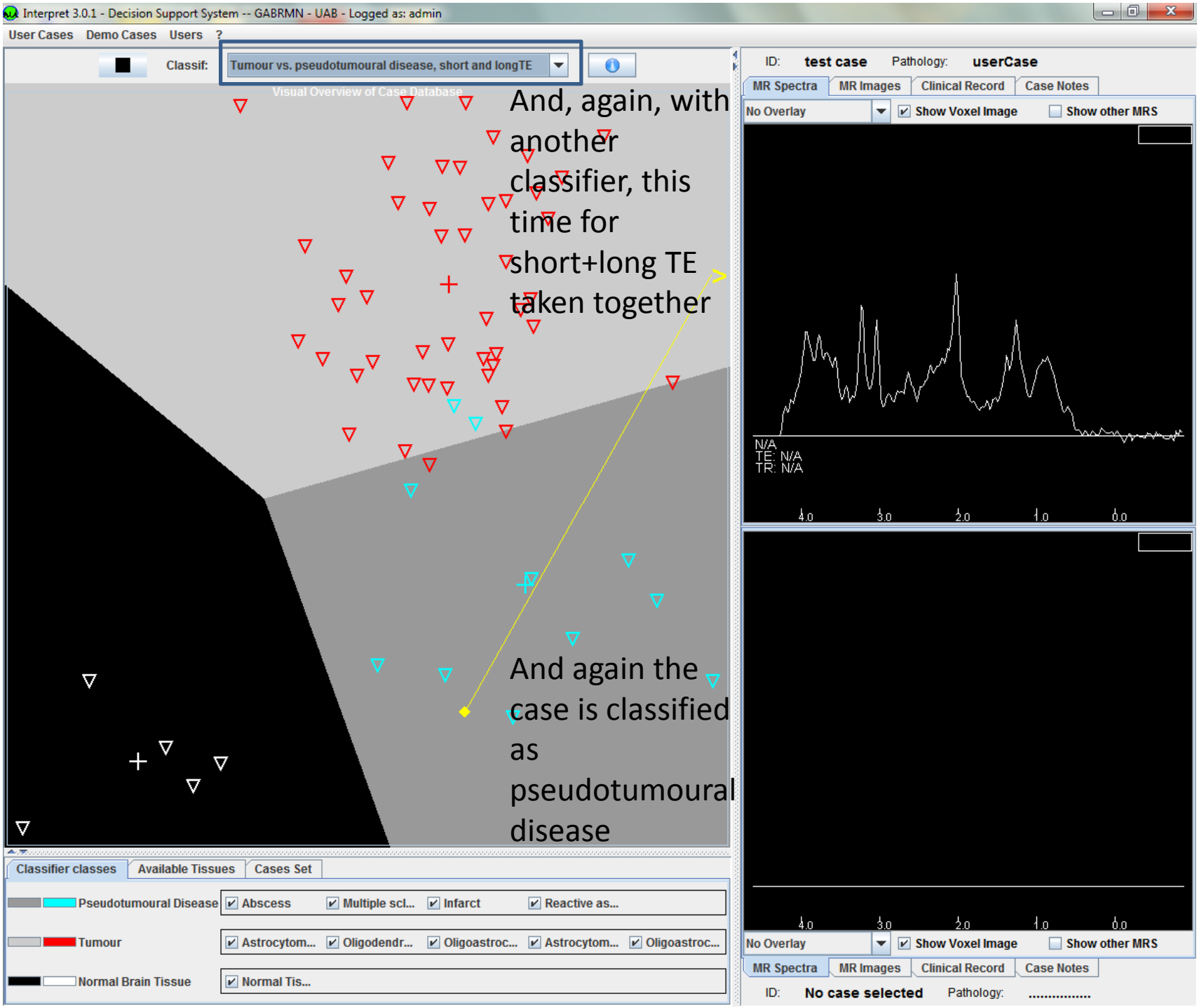

Interpret 3.0.1 - Decision Support System -- GABRMN - UAB - Logged as: admin
User Cases
Demo Cases
Users
?
Classif:
Most common tumour types, short TE
Visual Overview of Case Database
ID: test case
Pathology: userCase
MR Spectra
MR Images
Clinical Record
Case Notes
No Overlay
Show Voxel Image
Show other MRS
N/A
TE: N/A
TR: N/A
7.0 6.0 5.0 4.0 3.0 2.0 1.0 0.0 -1.0 -2.0
Classifier classes
Available Tissues
Cases Set
Low Grade
Astrocytoma 2
Oligoastrocytoma
Oligodendroglioma
Aggressive
Glioblastoma
Metastasis
Meningioma
Meningioma
ID: no case selected
Pathology: .....

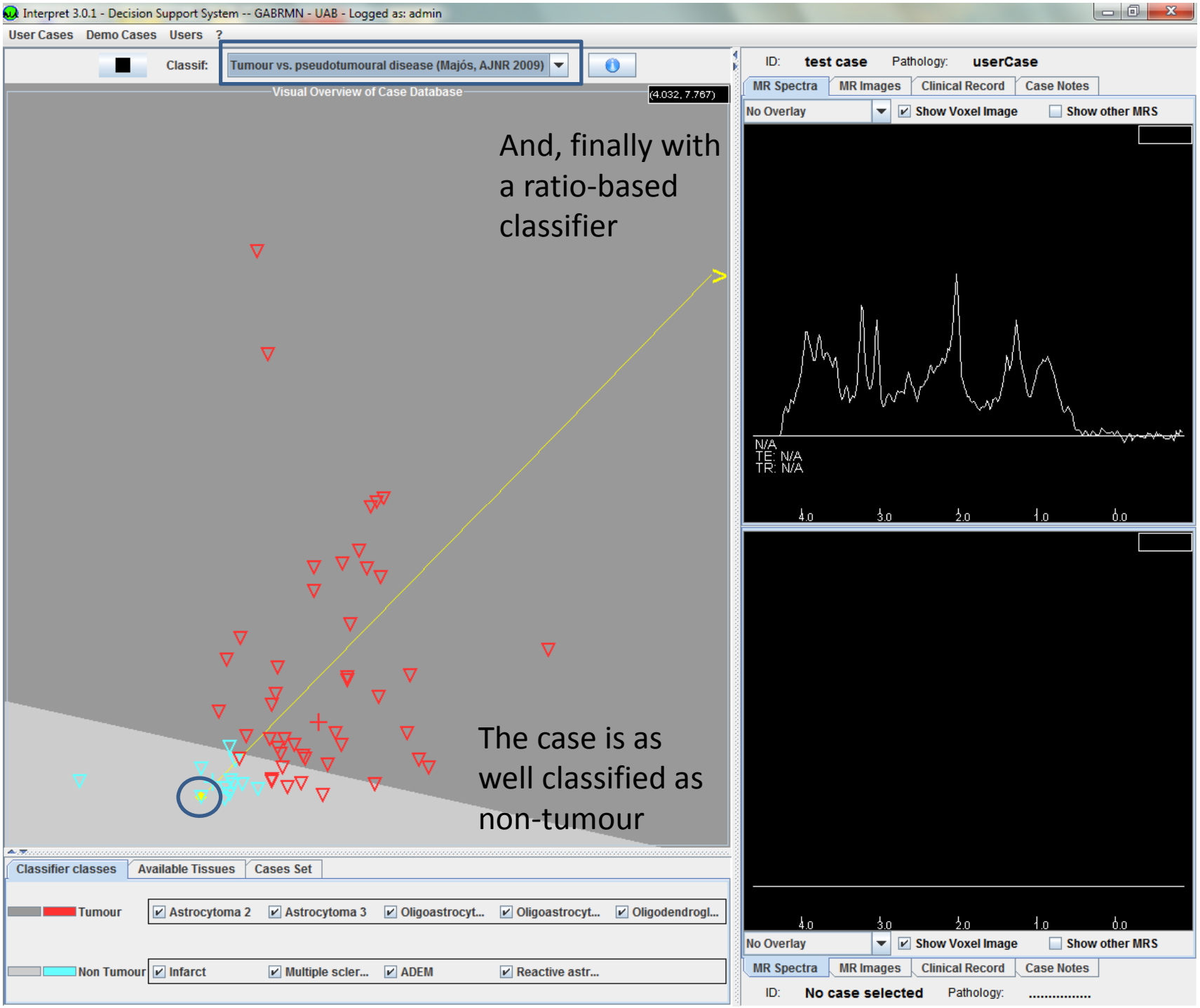

Interpret 3.0.1 - Decision Support System -- GABRMN - UAB - Logged as: admin
User Cases
Demo Cases
Users
?
Classif:
Tumour vs. pseudotumoural disease, short TE
Visual Overview of Case Database
We select a classifier that is interesting for our problem, for example the tumour vs. Pseudotumour, at short TE
Clicking the right button of the mouse shows this window
Find case
Zoom In
Default Zoom
Reset View
Show Boundaries
Selecting "Show Boundaries" will show the boundaries of the classifier
ID: test case
Pathology: userCase
MR Spectra
MR Images
Clinical Record
Case Notes
No Overlay
Show Voxel Image
Show other MRS
N/A
TE: N/A
TR: N/A
7.0 6.0 5.0 4.0 3.0 2.0 1.0 0.0 -1.0 -2.0
Classifier classes
Available Tissues
Cases Set
Pseudotumoural Disease
Abscess
Multiple scl...
Infarct
Reactive as...
Tumour
Astrocytom...
Oligodendr...
Oligoastroc...
Astrocytom...
Oligoastroc...
Normal Brain Tissue
Normal Tis...
ID: no case selected
Pathology: .....


Interpret 3.0.1 - Decision Support System -- GABRMN - UAB - Logged as: admin
User Cases
Demo Cases
Users
?
Classif:
Tumour vs. pseudotumoural disease, short TE
Visual Overview of Case Database
The case is classified as pseudotumural disease
ID: test case
Pathology: userCase
MR Spectra
MR Images
Clinical Record
Case Notes
No Overlay
Show Voxel Image
Show other MRS
N/A
TE: N/A
TR: N/A
7.0 6.0 5.0 4.0 3.0 2.0 1.0 0.0 -1.0 -2.0
Classifier classes
Available Tissues
Cases Set
Pseudotumoural Disease
Abscess
Multiple scl...
Infarct
Reactive as...
Tumour
Astrocytom...
Oligodendr...
Oligoastroc...
Astrocytom...
Oligoastroc...
Normal Brain Tissue
Normal Tis...
ID: no case selected
Pathology: .....


Interpret 3.0.1 - Decision Support System -- GABRMN - UAB - Logged as: admin
User Cases
Demo Cases
Users
?
Classif:
Tumour vs. pseudotumoural disease, short TE
Visual Overview of Case Database
We can compare the short TE spectrum of the case with other cases of the same class
ID: test case
Pathology: userCase
MR Spectra
MR Images
Clinical Record
Case Notes
No Overlay
Show Voxel Image
Show other MRS
N/A
TE: N/A
TR: N/A
4.0
3.0
2.0
1.0
0.0
PRESS
TE: 30ms
TR: 2000ms
Classifier classes
Available Tissues
Cases Set
Pseudotumoural Disease
Abscess
Multiple scl...
Infarct
Reactive as...
Tumour
Astrocytom...
Oligodendr...
Oligoastroc...
Astrocytom...
Oligoastroc...
Normal Brain Tissue
Normal Tis...
ID: IDI007
Pathology: Multiple sclerosis


Interpret 3.0.1 - Decision Support System -- GABRMN - UAB - Logged as: admin
User Cases
Demo Cases
Users
?
Classif:
Tumour vs. pseudotumoural disease, long TE
Visual Overview of Case Database
We can select select another classifier that is interesting for our problem, for example the tumour vs. Pseudotumour, at long TE
Again, the case is classified as pseudtumoural disease
ID: test case
Pathology: userCase
MR Spectra
MR Images
Clinical Record
Case Notes
No Overlay
Show Voxel Image
Show other MRS
N/A
TE: N/A
TR: N/A
4.0
3.0
2.0
1.0
0.0
Classifier classes
Available Tissues
Cases Set
Pseudotumoural Disease
Abscess
Multiple scl...
Infarct
Reactive as...
Tumour
Astrocytom...
Oligodendr...
Oligoastroc...
Astrocytom...
Oligoastroc...
Normal Brain Tissue
Normal Tis...
ID: No case selected
Pathology: .....


Interpret 3.0.1 - Decision Support System -- GABRMN - UAB - Logged as: admin
User Cases
Demo Cases
Users
?
Classif:
Tumour vs. pseudotumoural disease, short and longTE
Visual Overview of Case Database
And, again, with another classifier, this time for short+long TE taken together
And again the case is classified as pseudotumoural disease
ID: test case
Pathology: userCase
MR Spectra
MR Images
Clinical Record
Case Notes
No Overlay
Show Voxel Image
Show other MRS
N/A
TE: N/A
TR: N/A
4.0
3.0
2.0
1.0
0.0
Classifier classes
Available Tissues
Cases Set
Pseudotumoural Disease
Abscess
Multiple scl...
Infarct
Reactive as...
Tumour
Astrocytom...
Oligodendr...
Oligoastroc...
Astrocytom...
Oligoastroc...
Normal Brain Tissue
Normal Tis...
ID: No case selected
Pathology: .....


Interpret 3.0.1 - Decision Support System -- GABRMN - UAB - Logged as: admin
User Cases
Demo Cases
Users
?
Classif:
Tumour vs. pseudotumoural disease (Majós, AJNR 2009)
Visual Overview of Case Database
(4.032, 7.767)
And, finally with a ratio-based classifier
The case is as well classified as non-tumour
Classifier classes
Available Tissues
Cases Set
Tumour
Astrocytoma 2
Astrocytoma 3
Oligoastrocyt...
Oligoastrocyt...
Oligodendrogl...
Non Tumour
Infarct
Multiple scler...
ADEM
Reactive astr...
ID: test case
Pathology: userCase
MR Spectra
MR Images
Clinical Record
Case Notes
No Overlay
Show Voxel Image
Show other MRS
N/A
TE: N/A
TR: N/A
4.0
3.0
2.0
1.0
0.0
No Overlay
Show Voxel Image
Show other MRS
MR Spectra
MR Images
Clinical Record
Case Notes
ID: No case selected
Pathology: .....

- All classifiers available assign our problem case to the pseudotumoural class, and we can reasonably suspect that, according to the MRS, this case is NOT a tumour but a pseudotumoural disease.

- The patient had, in fact, a multiple sclerosis plaque that mimicked a tumour.