

## **Percutaneous treatment of lumbar disc herniation with gelified ethanol/ a preliminary study**

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## Aims and objectives

- Many therapies are available to treat lumbar disc herniation (LDH) ranging from medical therapies to minimally invasive percutaneous treatments and surgery
- A wide range of minimally invasive percutaneous treatments for LDH have been used: chemonucleolysis with chymopapain, percutaneous lumbar discectomy, laser disc decompression, intra discal oxygen-ozone therapy
- After the withdrawal of chymopapain, a new substance (Discogel®) is available using the properties of ethanol without its high diffusibility
- Discogel® is made up of ethanol (96%) with ethylcellulose to increase the viscosity and enhanced with a radiopaque substance (tungsten)
- The objectives of this study are:
  1. Evaluate the safety of disc nucleolysis using gelified ethanol in the treatment of LHD when the medical treatment is ineffective
  2. Demonstrate the efficacy of gelified ethanol in patients with radicular pain non responding to medical treatment

### Images for this section:

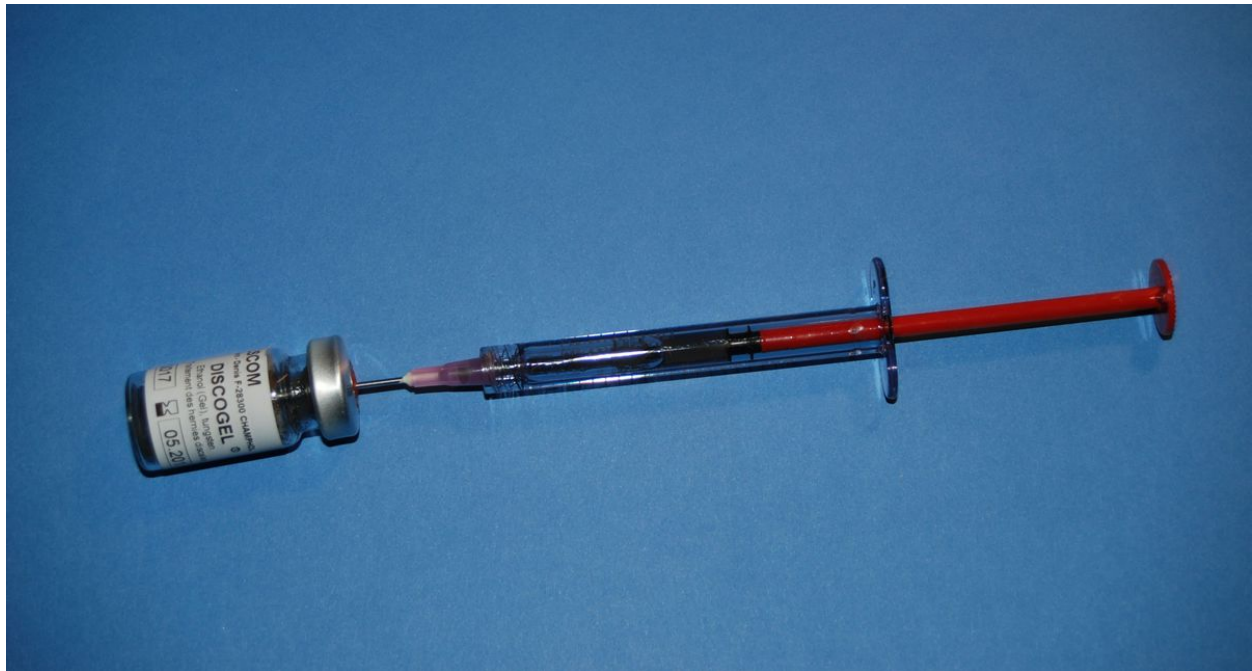
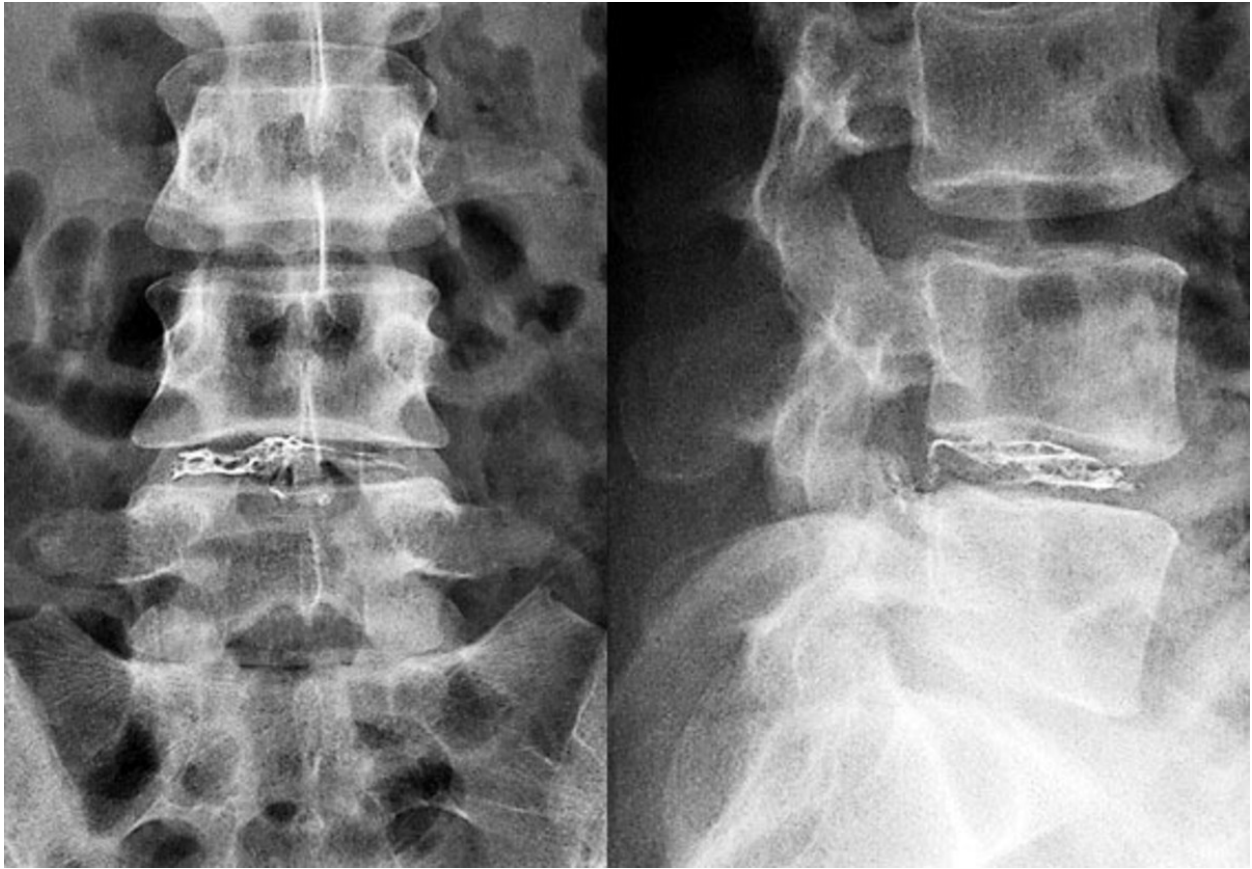


Fig. 1

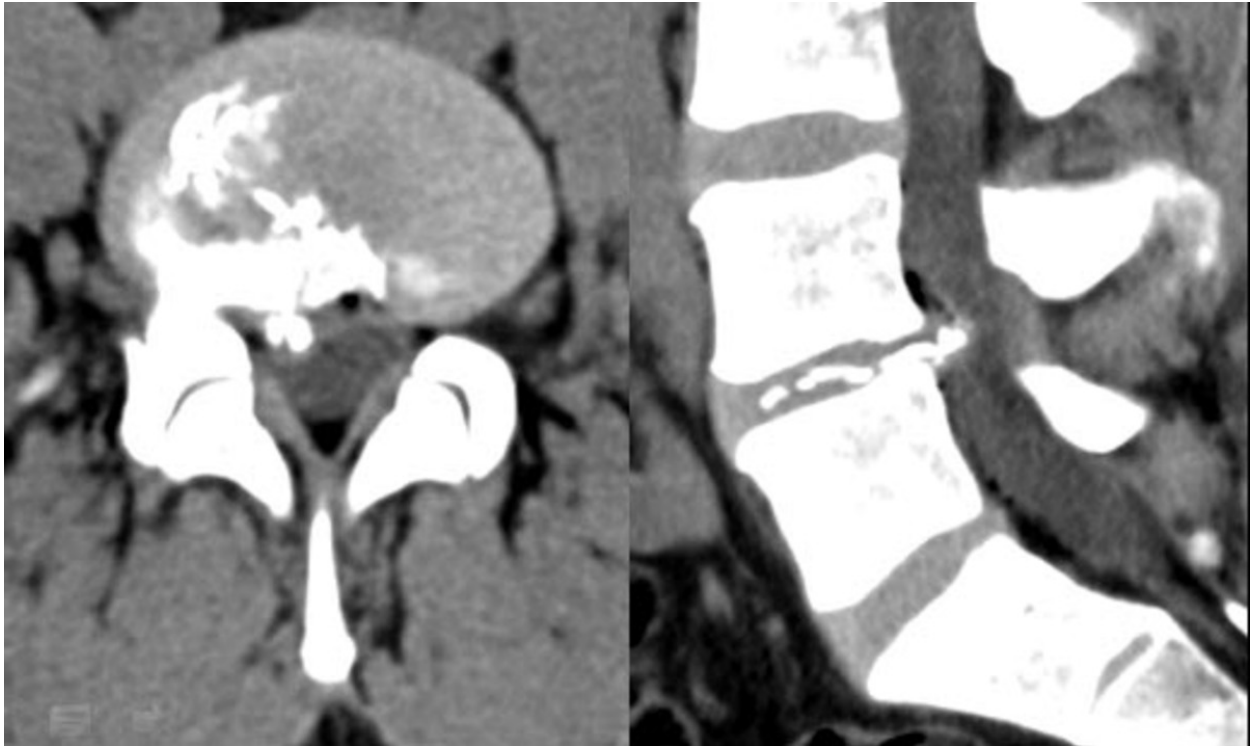
## Methods and materials

- From march 2010 to july 2013, 42 consecutive patients (22 male, 20 female) aged 22-80 years (mean age 45,1y) with a symptomatic LDH, were included in this study and were treated in ambulatory condition under local anesthesia with an intradiscal discogel® injection
- For all patients, the symptomatic level was identified by clinical examination, computed tomography (CT) or magnetic resonance imaging (MRI) and the radicular pain was resistant to conservative management, medication, physical therapies or steroid injections (2 or more)
- Exclusion criteria for nucleolysis are: calcified herniated disc or free disc fragment, important disc degeneration, important degenerative vertebral disease, lumbar stenosis, major neurological deficit with impaired lower limb mobility
- Discal puncture was performed under fluoroscopic guidance with an posterolateral extraspinal approach and 0,9 to 1,2 ml were injected into the disc (fig 2)
- A CT scan was performed after the injection to appreciate the Discogel diffusion into the treated disc (fig.3)
- All patients underwent clinical and MRI follow up four months after the nucleolysis to appreciate the follow up of LDH and to evaluate the possible signal changes of the treated disc and surrounding endplates
- Outcomes were assessed by visual analog scale (VAS), modified MacNab method (fig 4), questionnaire and direct patient interview

**Images for this section:**



**Fig. 2:** X ray after intradiscal Discogel injection



**Fig. 3:** CT scan performed after nucleolysis

Modified MacNab score for the assesement of treatment outcome	
Success	Failure
<i>Excellent</i> <ul style="list-style-type: none"><li>• Disappearance of symptoms</li><li>• Full recovery of physical activity</li></ul>	<i>Mediocre</i> <ul style="list-style-type: none"><li>• Insufficient improvement of symptoms</li><li>• Periodic need for medication</li><li>• Limited physical activity</li></ul>
<i>Good</i> <ul style="list-style-type: none"><li>• Occasional low back pain or sciatica</li><li>• No limitation on physical activity</li></ul>	
<i>Satisfactory</i> <ul style="list-style-type: none"><li>• Improvement of symptoms</li><li>• Limited physical activity</li></ul>	<i>Poor/ Surgery</i> <ul style="list-style-type: none"><li>• No improvement of symptoms</li><li>• Recourse to surgery</li></ul>

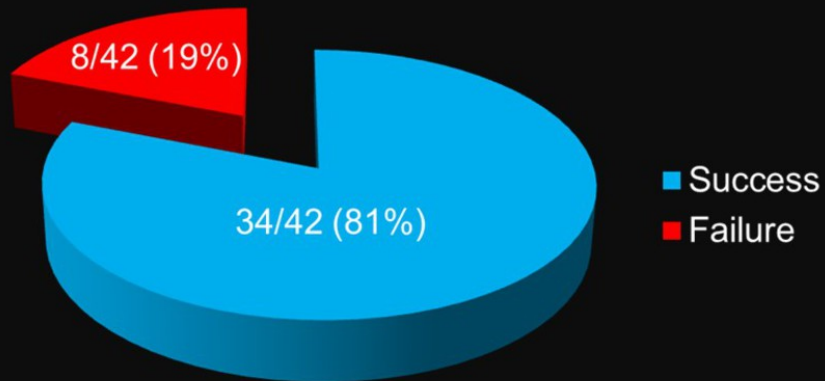
**Fig. 4**

## Results

- The discogel® chemonucleolysis can be performed under local anesthesia on a day hospital basis
- Very good results with total disappearance of radicular pain were obtained in 54,8% of cases (24/42) (fig 5, 6)
- Good results with a significant reduction of symptoms and medications were obtained in 33,3% (14/42) (fig 7)
- Bad results with the persistence of radicular pain and recourse to surgery in 11,9% (5/42)
- 2 patients underwent discolysis in 2 levels and no difference was observed in the results in comparison to those treated at one level
- The patients who subsequently underwent surgery had no negative effect on the successful outcome of surgical treatment
- Short term follow up (3-4 months) with MRI exam ( fig 8, 9) showed in all patients with very good or good clinical results a complete LDH disappearance in 16,7% of cases (7/42), a minimal reduction of hernia size (less than a quarter of hernia size) in 21,4% (9/42) and no change in 61,9% (26/42)
- The first sign of improvement responding to Discogel® chemonucleolysis occurred from one week to two months after the procedure
- No treatment-linked complications occurred in any patient:
  1. No pain during or after Discogel® injection
  2. No allergic reaction
  3. No change in the intersomatic disc space height
  4. No aseptic inflammatory complication or chemical discitis
  5. No signal change of intervertebral disc signal intensity
  6. No change of articular processes
  7. No change of bone marrow signal intensity of the surrounding endplates

**Images for this section:**

## Clinical outcomes 4 months after treatment



Success 81%		Failure 19%	
Excellent / Good	Satisfactory	Mediocre	Poor/Surgery
28 (67%)	6 (14%)	5 (12%)	3 (7%)

Fig. 5

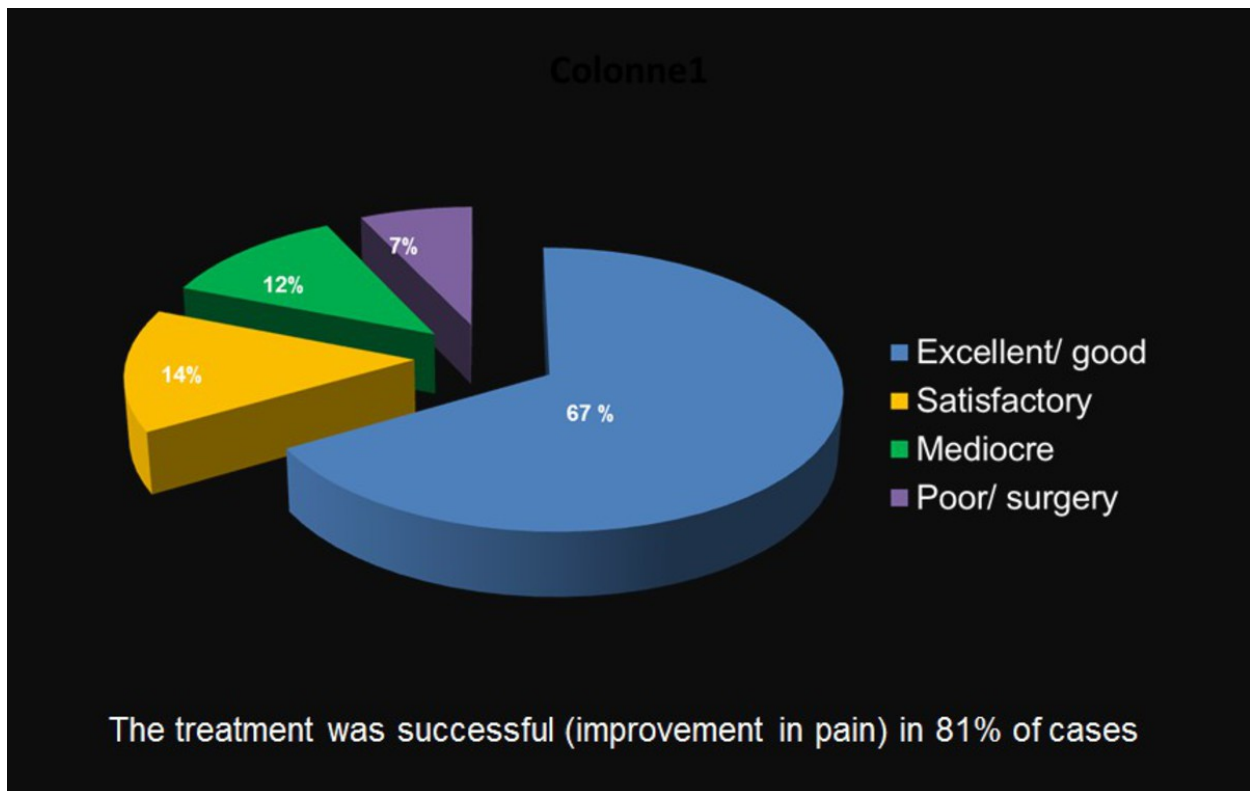


Fig. 6

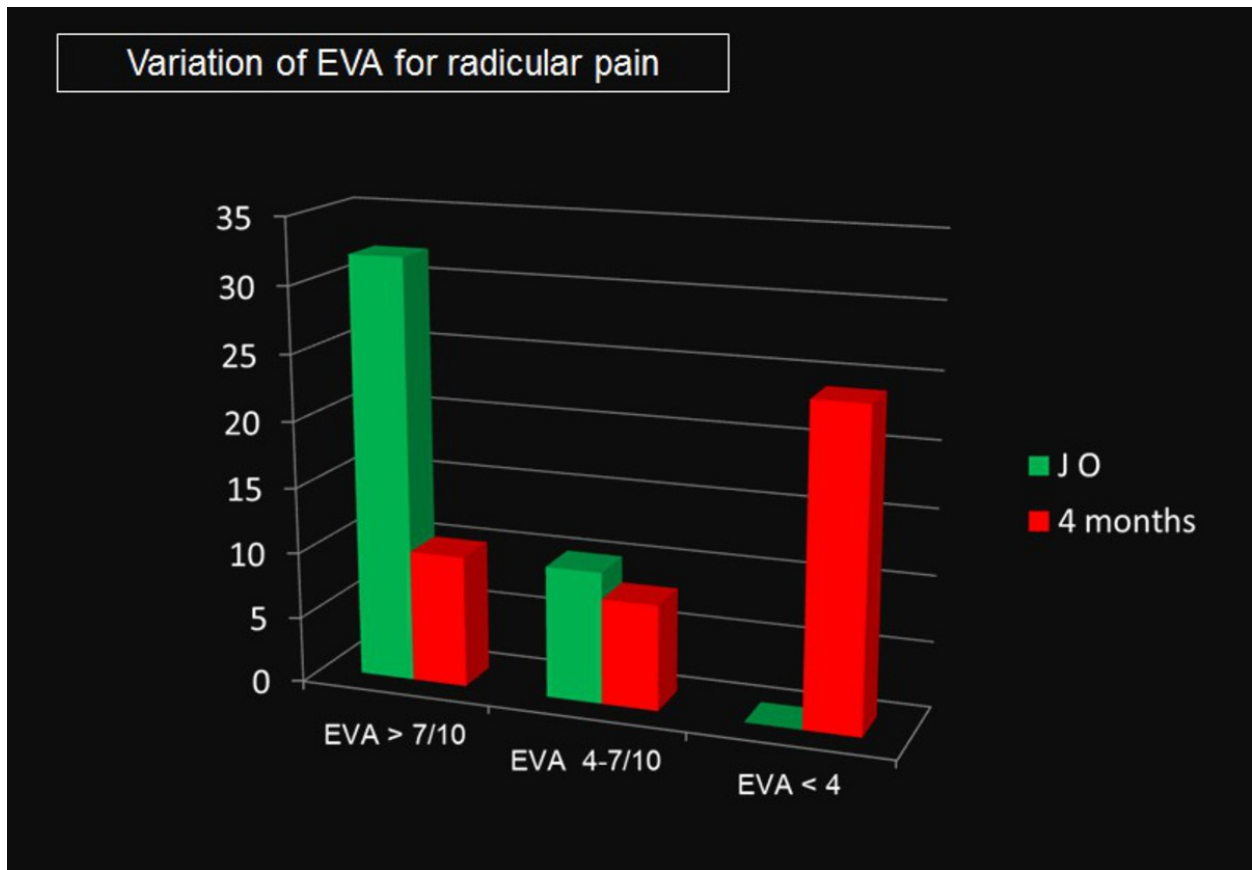


Fig. 7

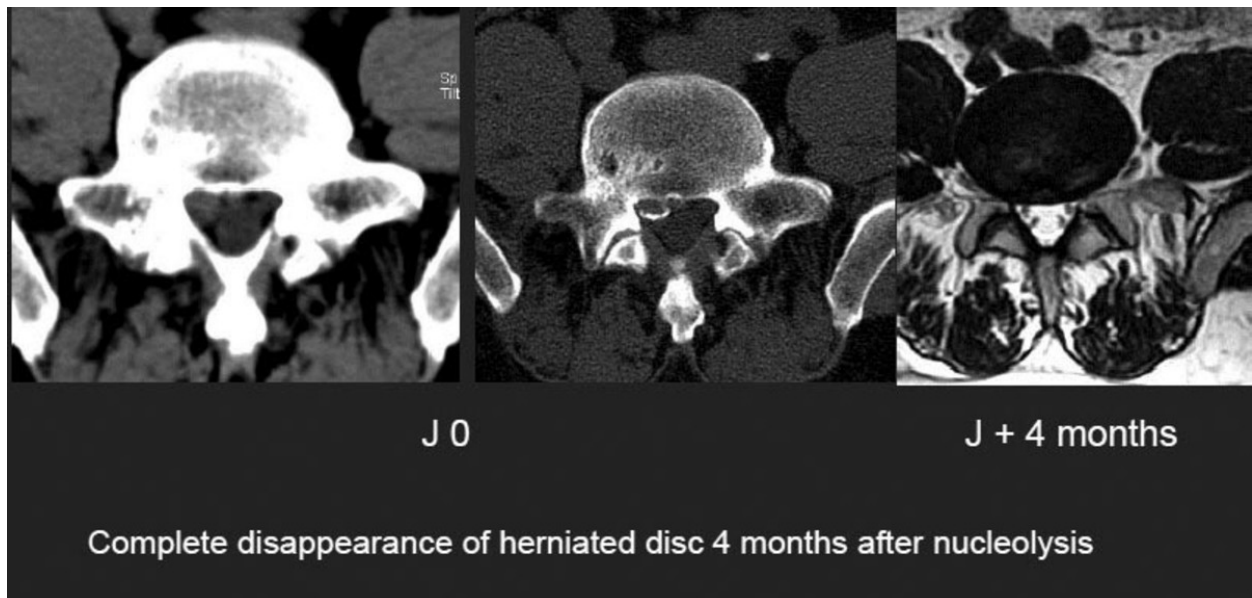
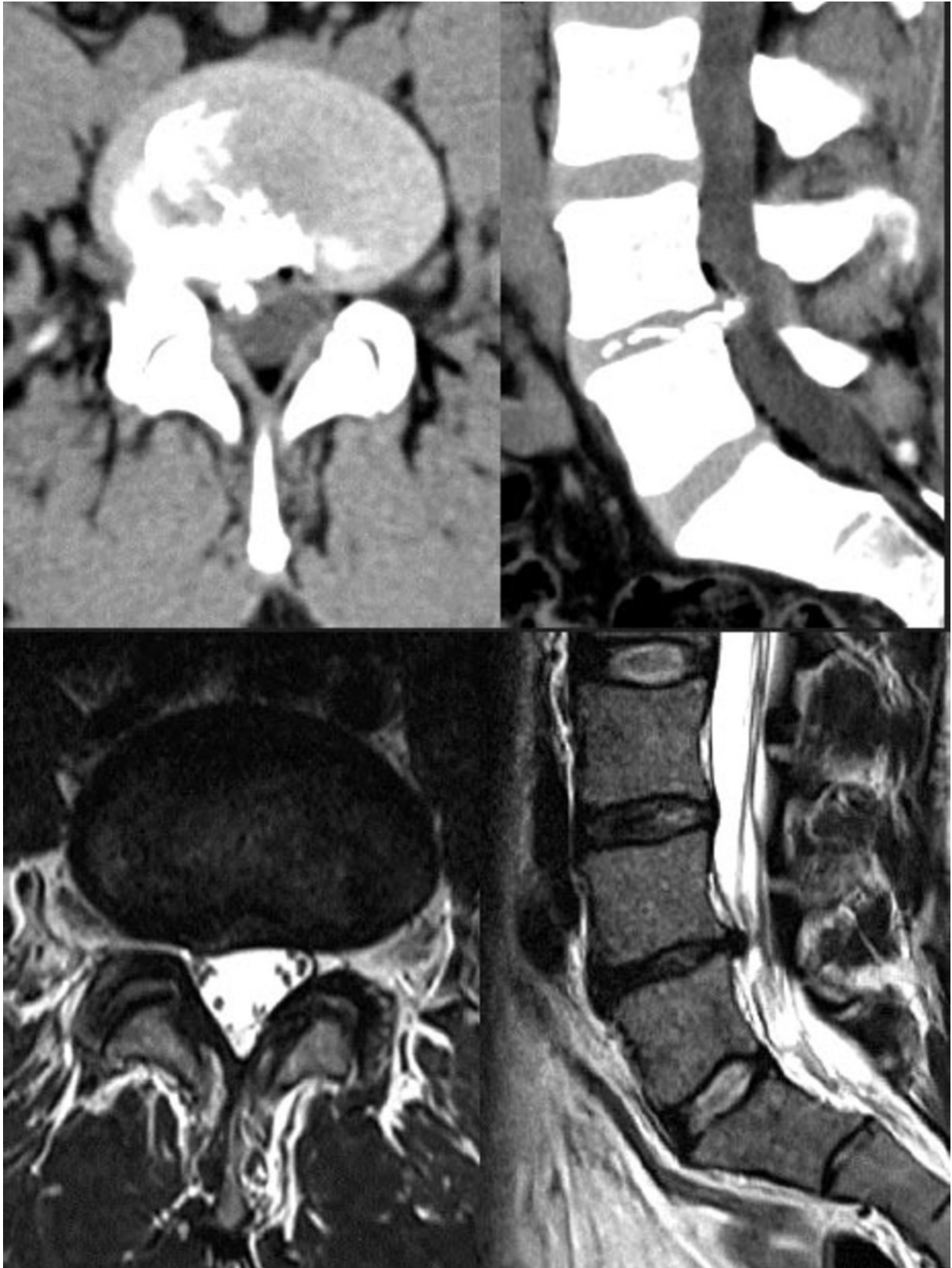


Fig. 8





**Fig. 9:** CT before and MRI 4 months after nucleolysis showed a decrease of herniated disc

## Conclusion

1. This preliminary study shows the efficacy and the innocuity of nucleolysis with gelified ethanol in the treatment of any kind of LDH
2. Discogel® is safe and easy to handle and there were no complications related to product diffusivity in or outside the treatment site
3. The therapeutic success rate of Discogel® nucleolysis in patients unresponsive to medical therapies was satisfactory
4. Discogel® nucleolysis can be an intermediate procedure bringing conservative medical treatments and surgery

## Personal information

No direct or indirect financial relationship pertinent with this study

## References

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