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Transilial vertebral blocking procedure (TVBP) using a dedicated titanium implant in cats with lumbosacral instability – clinical case studies and anatomical basis

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Summary

This article describes the use of the Transilial Vertebral Blocking (TVBP) procedure in 10 cats with varying degrees of defecation disorders, including difficulty assuming the defecation position, constipation, and, ultimately, the development of megacolon. Clinical signs alsoincluded reluctance to engage in physical activity, lameness, difficulty jumping onto elevated surfaces, and behavioral abnormalities. A theoretical Framework is also presented, based on the anatomical aspects of defecation disorders resulting from pathology of the lumbosacral junction. Each patient experienced hypersensitivity and tenderness in the lumbosacral spine. In All patients, dynamic radiographic examination revealed changes in the width of the L7-S junction with a marked narrowing in the hip-extended position. In one patient, static MRI may not detect the dynamic nature of lumbosacralin stability. The clinical conditio improved in All patients after surgery. In two patients who experienced small amounts of streaky feces, this tendency remained, but physical activity impairment and difficulty in posturing for defecation improved permanently. All patients experienced sustained and significant improvement after surgery. One patient experienced a complication involving the distal end of the implant from a right iliac wing being dislodged. No postoperative complications were observed in the remaining cats. Practical implications: Transilial Vertebral Blocking Procedure may be a potential alternative requiring further investigation in cats with mega colon syndrome, and can be aneffective, minimaly invasive solution for the treatment of lumbosacral instability in cats.

Keywords: cat, constipation, lumbosacral instability, megacolon, pain

The literature examines the incidence and location of intervertebral disc disease (IVDD) in cats, which is considered rare and mosty affects elderly cats, particularly at the lumbosacral junction (LSJ) (16, 27). Clinical signs may include reluctance to climb, lumbar pain, difficulty jumping, difficulty assuming a defecation posture, or other symptoms resulting from neurological deficits. However, because cats' symptoms are sometimes less severe and they have compensatory abilities, owners and clinicians may overlook them (27). Caudaequina syndrome (CES) results from lumbosacral junction pathology, potentially leading to spinal cord dysfunction. This condition, possibly linked to instability and degenerative lumbosacral stenosis, can causa secondary defecation disorders due to trauma or malformations, as seen in Manx cats (5, 8, 15, 31). Defecation disorders may be due to the fact that the lumbosacral plexus, responsible for controlling the coloanal and rectoanal reflexes, is formed by the L4-S3 nerve roots (25). LSJ stabilization surgery may involve external fixation, dorsal laminectomy, or a transilial vertebral blocking procedure (TVBP) (5, 7, 14, 16, 18). This investigation aims to clarify the mechanisms underlying lumbosacral stenosis and its impact on pain and defecation, to analyze LSJ width in cats with suspected lumbosacral instability, and to prezent clinical cases of TVBP with titanium implants. The theoretical basis for this condition is also discussed in relation to large intestine and analsphincter function.

Theoretical assumptions based on anatomy. To understand the relationship between lumbosacral junction pathology (instability and its consequences) and secondary defecation disorders, this study presents the anatomical relationships in this area. The basis for such assumptions is the described functional defecation disorders (including megacolon) in cats with injuries, without a history of trauma or congenital defects of the LSJ (Manx cats) (8, 15, 31). Both humans and cats have similar autonomic control (parasympathetic inhibition, sympathetic contraction). The innervation consists of intrinsic (EntericNervous System – ENS) and extrinsic (Autonomic Nervous System – Parasympathetic/Sympathetic) systems, which are largely similar in plan but show differences in neuroeffect or responses and anatomical den sity between the species (dogs and cats). The internal anal sphincter (IAS) in cats has a unique, complex response to pelvic nerve stimulation. While low-intensity stimulation can cause contraction, high-intensity stimulation can relax the internal anal sphincter (2, 6, 9, 10). This allows for a more graded, nuanced control of the sphincter, possibly reflecting their need to control voluntary defecation in a litterbox environment. The canine IAS is primarily maintained by sympathetic innervation, specifically from the lumbag colonic nerve (LCN) and hypogastric nerve (HGN). Studies show that reducing this sympathetic input causes a significant, immediate decrease in sphincter tone, demonstrating a high dependency on sympathetic tone to prevent incontinence (21). Disturbances in nerve conduction and, consequently, colonic motility (atonic intestine) may result from lumbosacral stenosis and other structural abnormalities in this area (34). The descending colon and rectum receive innervation from neurons in the S1, S2, and S3 spinal cord segments (sympathetic nuclei), with the highest concentration in S2. The large intestine, on the other hand, has dual sympathetic and parasympathetic innervation, both of which connect to the central nervous system. Parasympathetic innervation derives partly from the vagus nerve (enteric branches) and partly from the sacral parasympathetic nucleus (SPN) of the spinalcord (pelvic nerves). The thoracic and lumbar segments of the spinal cord are responsible for its sympathetic innervation, and some of these neurons also innervate the transverse colon (9, 10). Studies involving stimulation of the central roots of the S2 and SPN enhance motor responses in the large intestine. It has been concluded that this segment is responsible for the majority of innervation of the descending colon and rectum, playing a key role in controlling reflex motor activity of the large intestine (9). The pudendal nerve, which originates from the roots of the S1 and S2 spinal nerves, is responsible for controlling the activity of the EAS (25).

Impaired sphincter inhibition, characterized by relaxation of the anal canal musculature and simultaneous rectal filling, leads to obstruction and a hypertrophic megarectum. Urinary incontinence has not been observed in such patients (32). There is a high risk of developing megacolon with chronic spinal cord injury. The location and severity of the injury are also strongly correlated with the onset of symptoms. Lumbosacral injuries and stenosis impair parasympathetic innervation, immobilizing the lower colon and causing megacolon (12).

There is a relationship between the activity of the caudal portion of the large intestine and the sphincters controlling the anal canal. The internal anal sphincter, composed of smooth muscle, is motorically supplied by the hypogastric nerve (sympathetic nervous system). The pelvic nerves are responsible for inhibiting its activity (via the parasympathetic nervous system – mesenteric and hypogastric nerves). The external anal sphincter is composed of striated skeletal muscle and is controlled by the somatic pudendal nerves; reducing the frequency of motor impulses within it causes its relaxation (2). Antagonism between the lumbarsympathetic outflow and the sacralparasympathetic outflow has been observed. In the lumbar portion, colonic activity is inhibited, and the internal anal sphincter is motorically stimulated.

Meanwhile, colonic motor activity is stimulated by the parasympathetic sacral outflow, which simultaneously inhibits the internal anal sphincter, thereby relaxing it (2). Pressure on the nerves at the LSJ junction disrupts the rectoanal reflex, and consequently, distension of the colon and rectum does not cause relaxation of the anal sphincters. Spontaneous contraction of the EAS is also observed during defecation. Disturbances in the entire reflex mechanizm can lead to the passage of streaky, unsegmented fecal fractions (2). It has also been show that blocking conduction at the L2 level and higher does not inhibit this reflex. Whereas anesthesia of the L7-S1 region abolishes the tonic activity of the external anal sphincter, confirming the reflex nature of this muscle's tonicity. Furthermore, abolishing parasympathetic innervation (including the mesenteric and hypogastric nerves) does not affect the activity of the external anal sphincter. Consequently, the tonic inhibition reflex of this muscle, accompanied by colonic dilation, is still observed. Only the transection of the pudendal nerves abolishes the tonic inhibition reflex of this muscle. Simultaneously, an increase in itscontraction was observed (2). The pudendal nerves contain afferent and efferent fibers. A single pudendal nervecontinues to control the entire sphincter. Direct muscular activity of the EAS is associated with the transmission of impulses via afferent discharges.

S2 nerve plays a key role in transmitting impulses responsible for the tonicity of the external anal sphincter (1). Afferent impulses are transmitted via the dorsal roots of the sacral nerves. These nerves mediate the inhibitory colic-sphincteric and tonic reflexes. Nerve fibers in S2 also maintain anal tone (1). This means that the tonic contraction of the cat's EAS is maintained by reflex motor activity via the S2 sacral spinal nerves. Specifically, afferent impulses from the anal canal are transmitted via the dorsal roots to the spinal cord, triggering somatic reflexes. These reflexes result in efferent motor discharges, primarily through pudendal nerve branches originating from S2, which regulate the muscular tonus of the EAS (1, 2). The pudendal motoneurons in this segment are crucial for maintaining resting anal tone. This supports the theory that pathologies, including those resulting from pressure on the nerves around the LSJ junction, abolish the tonic inhibition reflex of the external anal sphincter, leading to defecation disorders.

Another argument for the key role of the lumbosacral plexus and for the role of pathologies of the lumbosacral junction in defecation disorders is data on the condition after injury to the sacrococcygeal (S-Sc) region. Fractures or luxations of the sacrococcygeal area in cats primarily result in micturition disorders (29). The pudendal nerves play a key role in the sensory and motor innervation of the urethral sphincter and the sensory innervation of the perineum and genital area. The hypogastric nerve, on the other hand, is responsible for the sympathetic innervation of the bladder detrusor muscle. This allows urine to be stored by relaxing the bladder wall. However, the mechanism controlling the micturition reflex, which simultaneously stimulates the detrusor muscle to contract while inhibiting the urethral sphincter (relaxing it), is controlled by higher centers in the brainstem and cerebrum (11, 29).

It is assumed that the mechanism of injury to the sacrococcygeal region occurs when the cat simultaneously moves, and its tail is stopped by a vehicle wheel. Damage not only to the S1-S3 nerves but also to the higher segments occurs. Despite this, defecation disorders are not a major complication, and when they do occur, they can be transient. It can also involve an injury to another part of the spine. Constipation resulting from injuries/damage to the pelvic nerves causes increased resting tone of the colon and rectum and decreased ability to defecate. However, because the colon and rectum are innervated by ascending fibers, the defecation reflex persists despite concomitant damage to the lower motor neurons of the pelvic nerves in cats with S-Sc injury. While micturition disorders are frequently the most acute symptom in cats with sacrococcygeal (S-Sc) injury, chronic defecation disorders and fecal retention/incontinence can also be observed as complications that often occur concurrently (19, 29).

The aim of the study was to assess the clinical condition and results of patients who under went transilial vertebral blocking procedure.

Material and methods

Ten cats with various clinical signs suggestive of lumbosacral instability were analyzed. These included: lumbosacral pain, mobili ty impairments, including reluctance to move, apathy, varying degrees of defecation impairment, including requiring enemas, and behavioral abnormalities, including aggression and lameness. Defecation abnormalities included streaky stools, constipation, difficulty assuming a defecation position, defecation outside the litterbox, and megacolon. Radiographic evidence of lumbosacral junction disease was demonstrated. The data included patients treated and monitored for transilial vertebral blocking procedure (TVBP) between April 17, 2025, and March 24, 2026. In each cat, surgery was performer using a new titanium stabilizing screw. Data were recorded for each patient, including age, sex, breed, body weight, clinical signs, medical history, duration of symptoms, and clinical and radiological examination results. Positional radiography was performed on each patient, consisting of a dynamic X-ray examination of the spine in a Lateran position with the limbs positioned in three positions relative to the body: P1 with the pelvic limbs extender cranially, P2 with the limbs neutralny positioned, and P3 with the limbs extended caudally, extending the hip joints.

Patients were qualified for treatment based on clinical examination and X-ray results. MRI performed in one cat did not reveal any changes in the lumbosacral junction; however, dynamic X-ray examination revealed significant narrowing of the L7-S space in this clinical case. Three-dimensional imaging (MRI and CT) was not performed in the remaining cats due to financial constraints. Finally, data on surgical outcomes were collected, and postoperative complications were documented.

The medicalrecords of 10 cats were reviewed: five European Shorthairs, four Maine Coons, and one Burmese. The group included six males and four females. All cats were spayed and weighed between 2.5 kg and 11.9 kg. Their ages ranged from 35 to 212 months, with a mean age of 112.6 months (Tab. 1). The main clinical signs observed before surgery included difficulty in assuming the defecation position and prolonged intervals between defecation.

Tab. 1. Characteristics of the group – age, sex, breed, body weight, neutered status

Cat No.	Breed	Age (months)*	Sex**	Neutering status	Body weight (kg)
1	European shorthair	170	M	Yes	5
2	Maine coon	45	M	Yes	10
3	Maine coon	84	M	Yes	6
4	Maine coon	59	M	Yes	6
5	Burmese	212	F	Yes	2.5
6	European shorthair	35	F	Yes	3.2
7	European shorthair	187	F	Yes	5
8	Maine coon	77	M	Yes	11.9
9	European shorthair	57	M	Yes	7
10	European shorthair	200	F	Yes	4.7

Explanation: *age at the time of surgery; **M – male, F – female

Clinical signs included reluctance to jump on elevated surfaces (n = 7), pain when palpated in the lumbosacral region (n = 10), defecation disorders (n = 8), behavioral disorders (n = 6), skin hypersensitivity in the lumbosacral region (n = 9), lameness (n = 1), and inability to defecate, requiring enema (n = 4), and the passage of streaky fecal particles (n = 2) (Tab. 2). Cats No. 2, 3, 4 and 8 required regular enemas, sometimes for several days in a row. None of the patients showed improvement after conservative treatment. Two cats that required daily enemas also did not improve. During the orthopedic examination, All patients exhibited skin hypersensitivity and noticeable tenderness in the lumbosacral region. A decision was made to perform a dynamic X-ray examination of the lumbosacral spine in three positions, i.e., P1, P2, and P3. The X-ray examination was performed in three positions of the pelvic limbs to simulate the movement of the lumbar-sacral junction during the cat's movement. The P1 position was achieved by moving the pelvic limbs cranially so that they rested under the abdomen, the P2 position was a neutral position, and the P3 position was a caudal position of the limbs, as when a cat jumps. The radiographic examination was performer under general anesthesia according to the standard anesthetic protocol (28). Premedication was achieved by intramuscular administration of dexmedetomidine at a dose of 3 µg/kg (Dexdomitor, Orion Pharma, Finland) and midazolam (Dormazolam, Dechra, Netherlands) at a dose of 0.3 mg/kg. Then, an intravenous catheter was placed on the left cephalic vein, and propofol (Propomitor, Orion Pharma, Finland) was administered at a dose of 1 mg/kg i.v. for induction of anesthesia. A tracheal tube (size 3.0-5.0 mm) was routinely placed.

Tab. 2. Frequency of clinical signs

Signs	Number of cases	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10
Reluctance to jump	7	+	+	+	+			+	+	+	
Pain in the LS region	10	+	+	+	+	+	+	+	+	+	+
Defecation disorders	8	+	+	+	+	+		+	+	+	
Behavioral disorders	6	+	+	+	+			+		+	
Skin hypersensitivity	9	+	+	+	+	+	+	+	+	+	
Lamenes	1										+
Need of enemas	4		+	+	+				+		
Streaky fecal particles	2					+		+			

Tab. 3. Changes in the width of the LSJ in a group of cats with suspected LS instability. Dynamic x-ray examination in 3 positions – P1, P2 and P3

Cat No.	P1 [mm]	P2 [mm]	P3 [mm]
1	2.27	1.33	1.04
2	2.68	2.23	1.42
3	2.75	2.40	1.58
4	2.30	2.21	1.30
5	0.70	0.52	0.30
6	2.40	1.44	1.20
7	0.99	0.78	0.52
8	3.14	1.84	1.05
9	2.27	1.99	0.99
10	1.48	0.91	0.66

Radiographs were taken before the main medical procedure. The cats were placed on the right side in Lateran recumbency (right Lateran view). A digital direct X-ray machine (PCMAX-100CAH, POSKOM, South Korea) was used for the study. Radiographic parameters used in the study were as follows: tube voltage = 46-50 kilovolts (kV), tube current and exposure time = 8-10 milliampere-seconds (mAs), and the source image receptor distance (SID) = 100 cm.

X-ray examinations revealed changes in the lumbosacral junction in 9/10 patients already in the neutral position. In all cats (10/10), dynamic X-ray examination of the LSJ showed a reduction in the width of the L-S junction (Tab. 3).

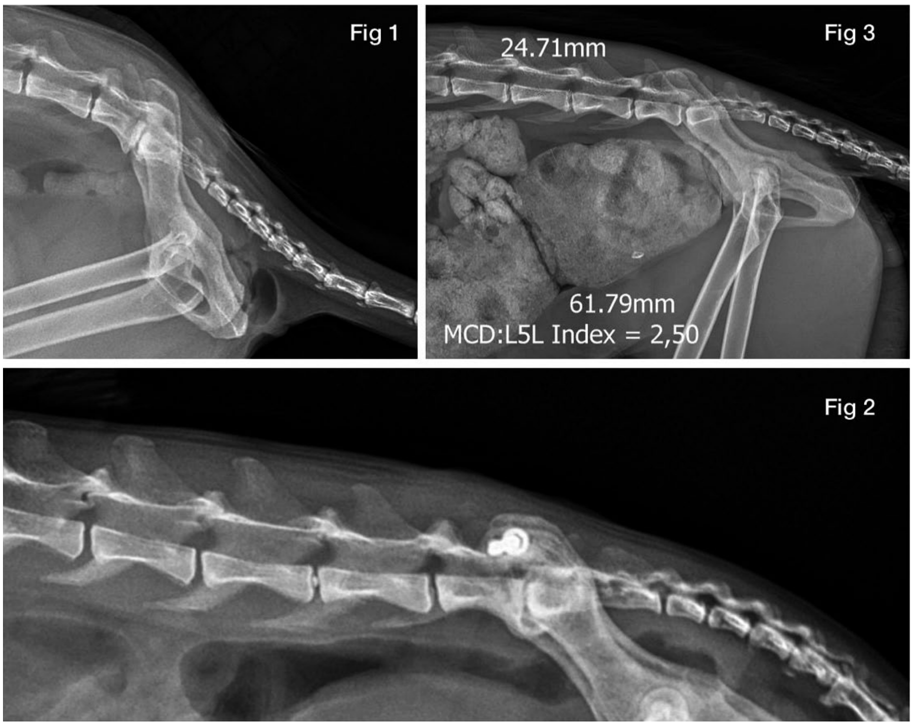

Fig. 1-3. The presence of stenosis and spondylosis changes of the L-S junction (Fig. 1 and 2) and a patient whose MCD:L5L index was 2.50 (Fig. 3). All images are lateral projections acquired in right lateral recumbency

As previously mentioned, radiographic changes were observed at the LS junction in 9 of 10 clinical cases. These included visible remodeling and stenosis of the lumbosacral junction. Cat No. 4 had a massive megacolon with an MCD:L5L index of 2.50 (Maximum Colon Diameter: Length of fifth lumbar vertebra) (Fig. 1-3).

All procedures were performed with owner consent and in accordance with institutional guidelines.

Implant design and surgical technique. A request was sent to the Mikromed BHH factory to develop an implant dedicated to cats. A decision was made to downsize the caudaequina decompression implant designed for dogs (Mikromed BHH, Poland). The titanium skrew features a 5 mm head diameter, a 2.8 mm major thread diameter, and a 2.2 mm shaft, with available lengths ranging from 35 mm to 50 mm. The smaller implant for cats retained the shape of a cannulated screw with double threads, allowing the insertion of a Kirschnerwire (guidewire) for precise implant placement. The implant was made of grade 5 titanium (Ti6Al4V). The schematic placement of the implant on the 3D bone model is presented in Figures 4-6.

Each patient was placed in a small positioner in the sternal position with their hind limbs slightly extended forward, just above the abdominal line. This positioning allowed for maximum flexion of the lumbar-sacral junction. The surgical area was prepared according to aseptic standards. A standard midline approach was made in this way that the base of the spinous process of the seventh lumbar vertebra and the medial parts of the transverse processes were visualized. The sacrum was not exposed. A minimalny invasive transgluteal approach to the iliac wing was made to plase a pilot Kirschnerwire. The difference between using a Kirschner wire for stabilization and a dedicated screw in this technique is that it bypasses the transgluteal approach to both iliac wings, and the skrew eliminates the need to bend the distal end of the wire in the previously described procedure. For correct skrew insertion, a 1.0 mm-diameter Kirschner pilot wire was used, inserted as described by Kowalczyk et al. (18). This shortens operative time and reduces the invasiveness of the procedure (Fig. 7-11). The wound was closed with absorbable monofilament Monosyn® 2-0 and 3-0 (Braun) sutures, and skin closure was performed with non-absorbable monofilament Nylon® 3-0 (Atramat). All transilial vertebral blocking proceduresłasted from 8 to 20 minutes. The time was measured from skin incision to skin closure.

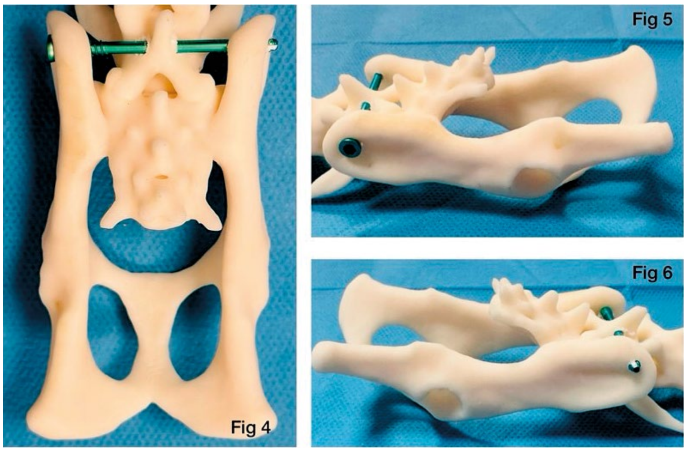

Fig. 4-6. Visualization of implant placement presented on a 3D model of the feline lumbosacral junction

Results and discussion

Clinical improvement following lumbosacral joint stabilization surgery was observed in all cases. In some clinical cases, defecation disorders persisted. Cats No. 5 and No. 7 continue to pass streaky stools. However, their mobility has improved significantly. They were more playful, and jumping onto elevated surfaces was no longer a problem. Cats that required enemas for several days in a row also showed significant clinical improvement. Enema use was ultimately discontinued in all patients. Cats No. 2, 3, and 8 quickly showed improvement. Cat No. 4 required several more enemas during the first 3 months after surgery. Ultimately, the use of lubricants and rectal enemas to facilitate stolo gliding helped, and to this day (7 months in total after surgery, 4 months without enemas), they do not require enemas. Cat No. 2 discontinued the use of lubricants four weeks after the surgery. However, a defecation problem arose 2.5 months after the procedure. Administering a small dose of medication to facilitate stolo passage has helped; to date, no enemas have been required. Lumbar pain subsided in all operatem cats. The cat with severe aggression (No. 9) showed significant improvement in mobility and behavior. Aggressive attacks toward people no longer occurred, and their frequency toward other cats significantly decreased, which, according to the owner, remains within the normal range.

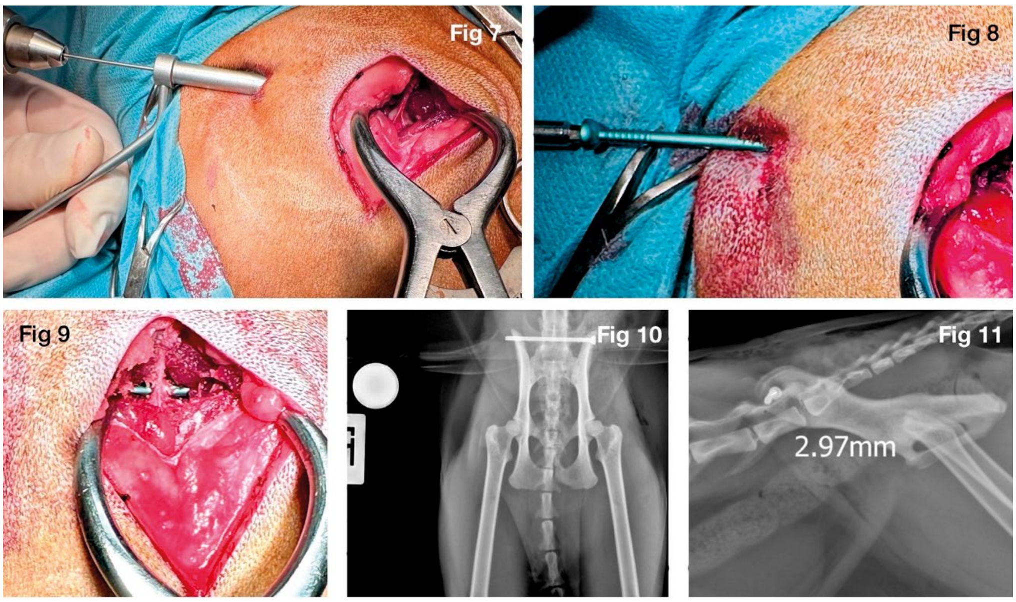

Fig. 7-11. Surgical technique of implant insertion and X-ray control in a cat undergoing TVBP procedure: (10) ventrodorsal view and (11) lateral view (Cat No. 9)

In case no. 1, a complication arose. The distal end of the screw placed in the right iliac wing was dislodged. As a result, the pain and aggression worsened in the first two weeks following surgery. It was decided to perform a reoperation. This included reimplantation of a new, larger-diameter screw. A significant improvement in the patient's clinical condition was observed just 5-7 days after the procedure. The pain and aggression decreased. In the remaining cases, no postoperative complications were observed. The longest postoperative follow-up period was 51 weeks, and the shortest was 4 weeks. However, improvement was evident in all cats (Tab. 4).

Tab. 4. Postoperative follow-up time and occurrence of postoperative complications

Cat No.	Postoperative follow-up time [weeks]	Complications
1	6	Yes
2	14	No
3	8	No
4	22	No
5	11	No
6	4	No
7	20	No
8	44	No
9	51	No
10	4	No

There are a few publications on lumbosacral instability in cats, but they often do not include large numbers of cases (4, 5, 7, 14, 15, 18, 30). Specific studies on surgically treated lumbosacral disease in cats are rare and often consist of small case series. Some studies have focused on the presence of lumbosacral transitional vertebrae (LTV) and their association with instability, leading to lumbosacral junction stenosis. Broader analyses of spinal disease in cats show that lumbosacral disease is significantly less common in cats than in dogs, which may explain the limited number of publications. One retrospective study identified only 13 cats with lumbosacral stenosis over a long period (13). On the other hand, some imaging studies have shown that changes in the lumbosacral junction (LSJ) can be detected incidentally. One of the patients described in this study: cat No. 9 presented with typical symptoms (see Table 2), showed in May 2022 a normal appearance of the lumbosacral junction on MRI. However, given the unsatisfactory results of conservative treatment, a dynamic X-ray examination performed in February 2025 confirmed lumbosacral instability, and the stabilization procedure was performed. Since the treatment resulted in a lasting improvement in the clinical condition, to date, the dynamic LSJ examination has been shown to be helpful in diagnosing patients in whom no pathological changes are observed in the neutral position, even during MRI.

One such study showed clinical DLSS in 12 of 114 cats (10%). The same study showed that another 16 cats had subclinical LSJ changes detected incidentally on MRI (30). These results indicate that pathology in the lumbosacral junction can often be missed. This may also be related to this species's ability to compensate for clinical signs. Cauda equina syndrome (CES) in felines is primarily caused by the gradual breakdown of intervertebral discs, which ultimately results in lumbosacral instability (6, 7, 22, 24). Increased mobility in this area of the spine may increase the risk of injury and overload (4). In the initial phase of the disease, changes in the intervertebral disc structure occur, leading to deterioration of its properties and joint surface overload. As a result, the progressive instability of the L7-S junction promotes the formation of osteophytes on the inferior surface of the joint surfaces and the L7 endplate. This condition is referred to as stenosis. Narrowing of the L7 intervertebral foramina and hypertrophy of the interlamellar ligament reduce the lumen of the spinal canal in the dorsal view and lead to compression of the neural structures in this region (3, 26).

As described above, this is an extremely important site from a neuroanatomical perspective for the operation of the defecation mechanism. Statistical analysis of the lumbosacral junction width (LSJW) comparison between healthy and diseased cats revealed that in the secondo group, the width of this junction was significantly smaller in the neutral (P2) and extended (P3) positions (data in published). However, examination in the P1 position appears to have no clinical significance in the diagnosis of LSI. This confirms the disease's dynamic nature. Cats, as a species that frequently jumps, may exhibit symptoms primarily during movement, especially when this junction is in extreme positions (flexion and extension). We assumed that sex, breed, age, and body weight might be associated both with the probability of having the disease and with the LSJW and therefore might confound. At the same time, to provide a minimalny invasive solution for lumbosacral instability in cats, it was decided to modify the existing treatment for cauda equina syndrome in dogs. The implant routinely used in this species was miniaturized to be in a size suitable for a cat. The previously described Kirschner wire is a solution previously used in pelvic traumatology. A dedicated solution was chosen for this-specific condition, lumbosacral instability.

The procedure was performed on 10 cats with confirmed lumbosacral instability and clinical signs ranging from pain to defecation disorders. All patients demonstrated clinical improvement, but 2 of 8 cats continued to experience defecation disorders. This may be due to several factors, including the fact that these were the two oldest cats in the study, chronic instability could have led to irreversible neuropathy, and the fact that they had the most severe stenosis of the lumbosacral junction. The P3 in cats 5 and 7 was 0.30 and 0.52 mm, respectively. Taking a critical view of such chronic changes, it is worth considering whether additional dorsal laminectomy or other supportive and decompressive procedures would be appropriate in those cases. Apart from the fact that they still passe streaky stool fractions, the act of defecation itself, the posture for defecation, and overall mobility, as well as the behavior, improved significantly in the above-mentioned cases.

It should be noted that the lack of dynamic MRI of the spine in all cats is a limitation of this study. This fact provides room for further research in this area. Returning to these two cats, the owners assessed the improvement of the clinical condition on a 4-point scale (poor, average, good, very good) and rated it as good.

Observations based on the described clinical cases and literature data lead to the conclusion that the breed most susceptible to the development of large colon and defecation disorders is the Maine coon (23). Analyzing the anatomical conditions and the possibile cause-and-effect relationships described in the theoretical assumptions, it would also be necessary to conduct further research, possibly including mapping of the spinalcord in individual cat breeds, with particular emphasis on the Maine Coon breed. A study could be performed on comparative neuroanatomy of the lumbosacral spinalcord, with the main aim of creating a high-resolution MRI atlas that magnifies the lumbosacral spinalcord in selected cat breeds (33). In this case, the use of invasive methods could be avoided (20).

Due to the limited number of surgical patients to date and the lack of a control group, conclusions from this studyshould be interpreter cautiously; further research is warranted.

Analysis of the anatomical conditions surrounding the lumbosacral junction demonstrates the validity of the approach used to address lumbar spine instability in cats. The compensatory abilities of this species can mask symptoms, but a thorough clinical examination and dynamic X-ray can be helpful in decision-making. In all described clinical cases, improvement in clinical condition was observed after the TVBP procedure. The authors believe that transilial vertebral blocking procedure is a good, minimally invasive alternative for treating the aforementioned instability. Measurement at the P3 position accurately shows diseased cats. It seems important that performing the examination in a neutral position, even with the use of MRI, may produce a false negative result, as shown in the case of cat No. 9. However fluoroscopy-guided TVBP should be considered in the future. The authors are aware of the limitations of performing a two-dimensional examination, such as an X-ray. Additionally, MRI will allow assessment of the impact of specific positional changes on neural structures around the LS junction, but should be performed in dynamic positioning. Another aspect worth considering is mapping the spinal cord and lumbar nerve roots in selected cat breeds. In particular, the analysis should consider the anatomical conditions in Maine Cooncats, which are particularly susceptible to developing megacolon syndrome.

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