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Computed tomography guided percutaneous transdiscal splanchnic nerve block for cancer pain treatment. Case report

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Abstract

Two cases of percutaneous transdiscal splanchnic nerve block for cancer pain treatment presented. Case 1. 50 years old man with pancreatic head and trunk cancer T4N1M0. Patients condition: intractable pain in upper abdomen during last two weeks, dysphagia, weight loss. Cholecysto-entero, gastro-entero and entero-entero anastomoses performed under epidural+general anesthesia. During 7 postoperative days pain relieved by continuous epidural anesthesia (0.2% ropivacain 5ml/hour). On postoperative day 8 epidural catheter removed due to dis-

lodgement. Morphine sulphate 10 mg iv injections with 4 hour intervals and cox-2 pathway inhibitors was not sufficient for pain relief (pain score – 6-8 VAS). Splanchnic neurolysis performed on postoperative day 14. Patient laid in prone position on the computed tomography table. After marking of injection sites, definition of needles traces and deep local infiltration with 1% lidocain, two 22 gauge 20 cm Chiba needles had been inserted transdiscally on the level of T12/L1. Pain relieved after injection of 4 ml 2% lidocaine on each side10 ml 10% aqueous phenol had been injected on each side for neurolytic block 0.1 g cefazolin injected intradiscally Patient had complete pain relief until day 5, when he felt severe continuous pain on his upper right abdomen. After two weeks of follow-up incomplete right splanchnic block diagnosed and to perform of repeated right side splanchnic neurolysis had been decided. On day 14 after 1-st neurolysis, a 3½ inch 25 gauge Quincke needle had been inserted in right retrocrural space on the level of L1. After contrast and 4ml 2% lidocaine injection, 15 ml 95% alcohol injected Pain relieved completely. No additional analgesia requirements lifetime (10 weeks). Case 2. 62 years old male with gastric cancer. Cancer recurrence after partial gastrectomy and severe intractable abdominal pain. 120 mg morphine hydrochloride daily, pain score 6-8 VAS. T12-L1 computed tomography guided transdiscal splanchnic nerve block performed in patient prone position. After marking of injection site at left side from vertebral column and deep infiltration with 1% lidocaine, a 22G 20 cm Chiba needle had been inserted. 0.1g cefazolin injected intradiscally. Intervertebral disk penetrated centrally and contrast spread was equal on both sides between aorta and L1 vertebra. Pain relieved after injection of 5 ml 2% lidocaine and 15 ml 95% alcohol. After procedure pain score – 3-4, patient was needed in 10 mg morphine hydrochloride and 150 mg lyrica daily. Computed tomography guided transdiscal splanchnic neurolysis is a safe and effective treatment tool for upper abdomen cancer pain relief. In cases of incomplete neurolysis repeated neurolytic block may be helpful.

KEY WORDS: cancer; pain; splanchnic/celiac; neurolysis; computed tomography

Introduction

The majority of people with cancer will experience pain. In most cases it is related to tumor involvement or associated with cancer therapy and in 3% of cases can be unrelated to cancer or therapy [1]. Conservative treatment is effective for over 90% of patients with cancer related pain. Therefore 5-10% of these patients are needing in interventional or surgical pain treatment. Interventional methods are different nerve blocks, neurolysis/ablation, insertion of permanent ports, pumps, stimulation electrodes [2]. Splanchnic/celiac plexus neurolysis is characterizing with high success rate for intractable cancer pain relief and can be performed with different methods and approaches [2]. We are presenting two cases of computed tomography (CT) guided percutaneous splanchnic neurolytic block.

Case presentation

Case 1. The patient was a 50 years old man with pancreatic head and trunk cancer T4N1M0, not treated previously. At the time of hospitalization patient experienced the constant, intractable pain in upper abdomen during last two weeks which was related with dysphagia, loss of weight. Cholecystic-enteric, gastro-enteric and enteric-enteric anastomoses performed under epidural+general anesthesia. Open anterior alcohol celiac plexus block planned for pain relief but it was not performed due to tumor and metastases spread. Therefore during 7 postoperative days pain relieved by continuous epidural anesthesia (0.2% ropivacain 5ml/hour). On postoperative day 8 epidural catheter removed due to dislodgement. Conservative management using morphine sulfate 10 mg iv injections with 4 hour intervals and cox-2 pathway inhibitors was not sufficient for pain relief (pain score – 6-8 VAS, sleep disorder).

After receiving of informed consent, splanchnic nerve neurolysis performed on postoperative day 14. The patient was kept fasting for 6 h before the procedure and 500 ml of normal saline infused for prehydration. Morphine sulfate 10 mg had been injected i. v. 2h before the procedure. Patient placed in prone position on the computed tomography table and standard ASA monitoring systems had been connected. Under the sterile conditions, after marking of injection sites, definition of needles traces and deep local infiltration with 1% lidocaine, two 22 gauge 20 cm Chiba needles had been

inserted transdiscally on the level of T12/L1. Cefazolin 0.1 g injected intradiscally. Needles final positions confirmed by the spread of contrast and 1% lidocaine solution (8 ml for each side) along the anterolateral border of vertebrae and intervertebral disk (Fig 1). Pain relieved completely and 10 ml of 10% aqueous phenol had been injected on each side for neurolytic block. Patient had complete pain relief until day 5, when he felt severe continuous pain on his upper right abdomen. After two weeks of follow-up incomplete right splanchnic block diagnosed and to perform of repeated right side splanchnic neurolysis had been decided. On day 14 after 1-st neurolysis, a 3½ inch 25 gauge Quincke needle had been inserted in right retrocrural space on the level of L1 (Fig. 2). After contrast and 4ml 2% lidocaine injection, 15 ml 95% alcohol injected on this side (Fig. 3) Pain relieved completely. No additional analgesia requirements lifetime (10 weeks).

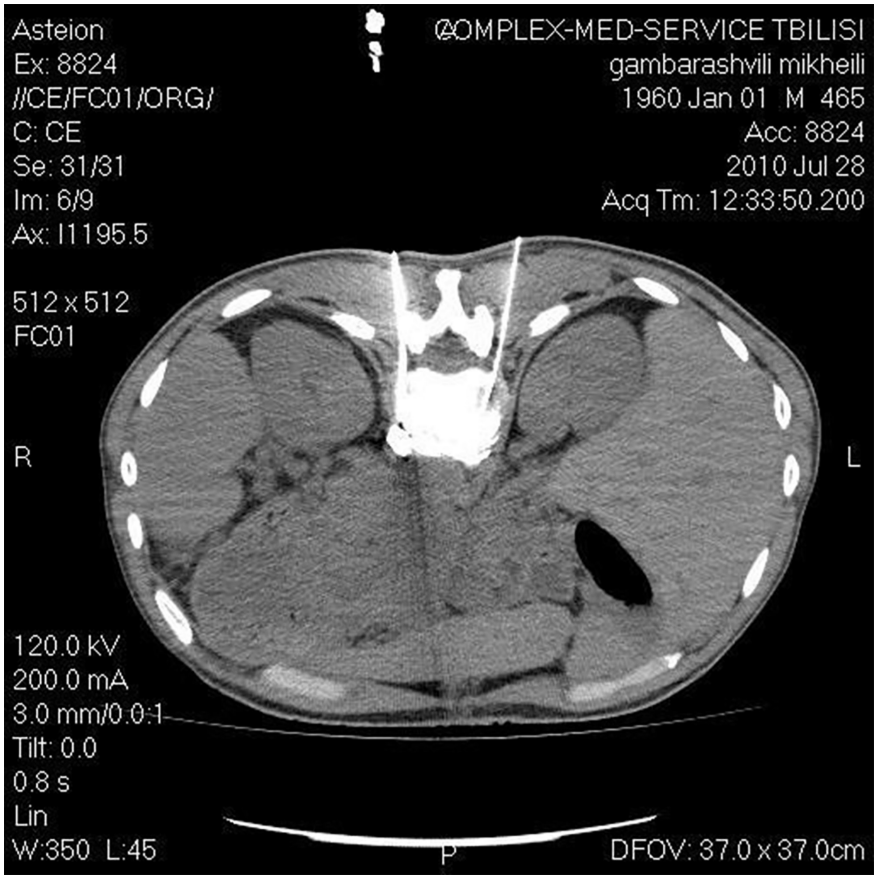

***Fig. 1**. Two sided transdiscal needle insertion and contrast spreed*

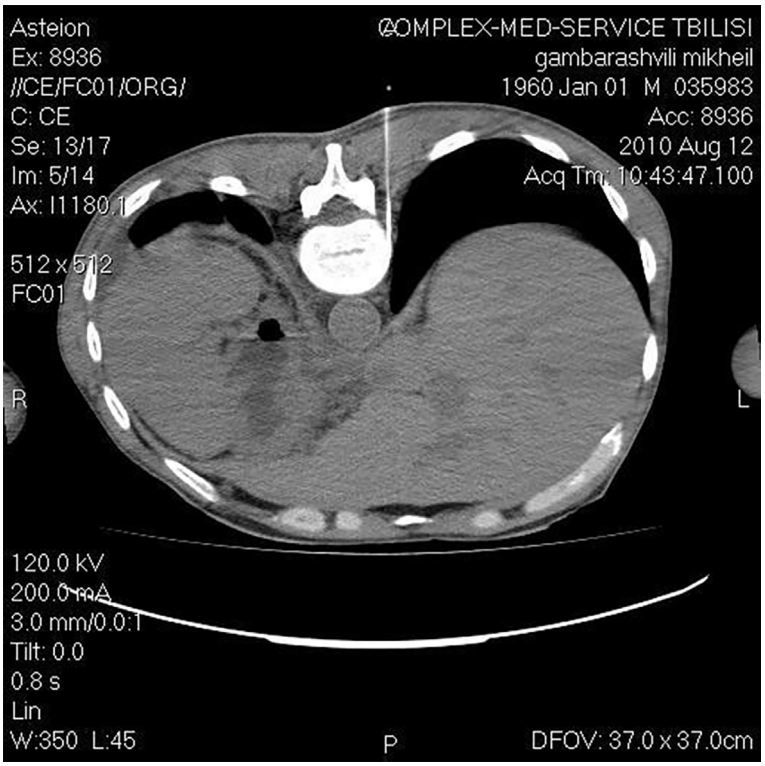

***Fig. 2**. Needle insertion in right retrocrural space*

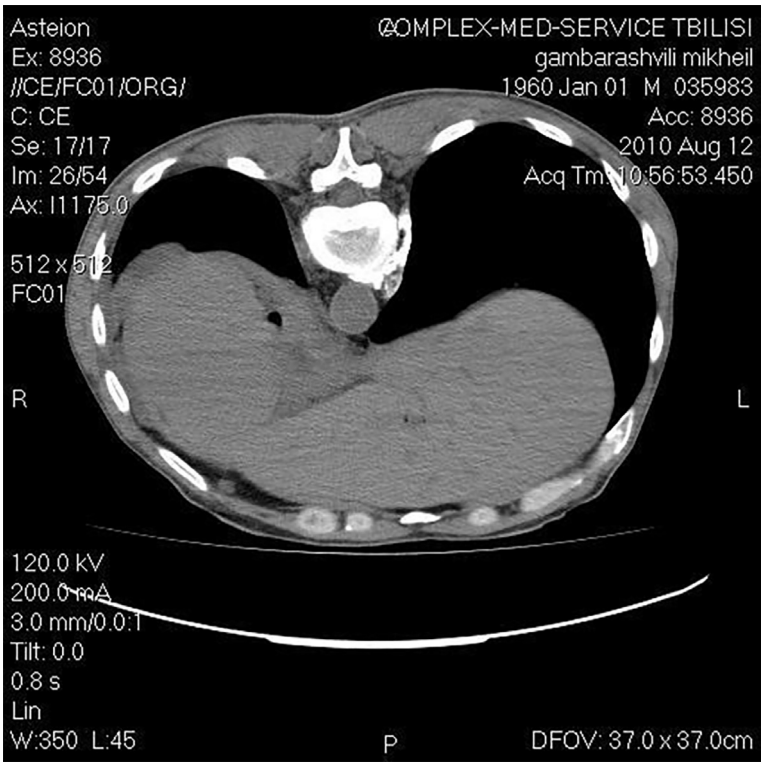

***Fig. 3**. Neurolitic solution and contrast on the anterolateral surpace of L1 vertebrae*

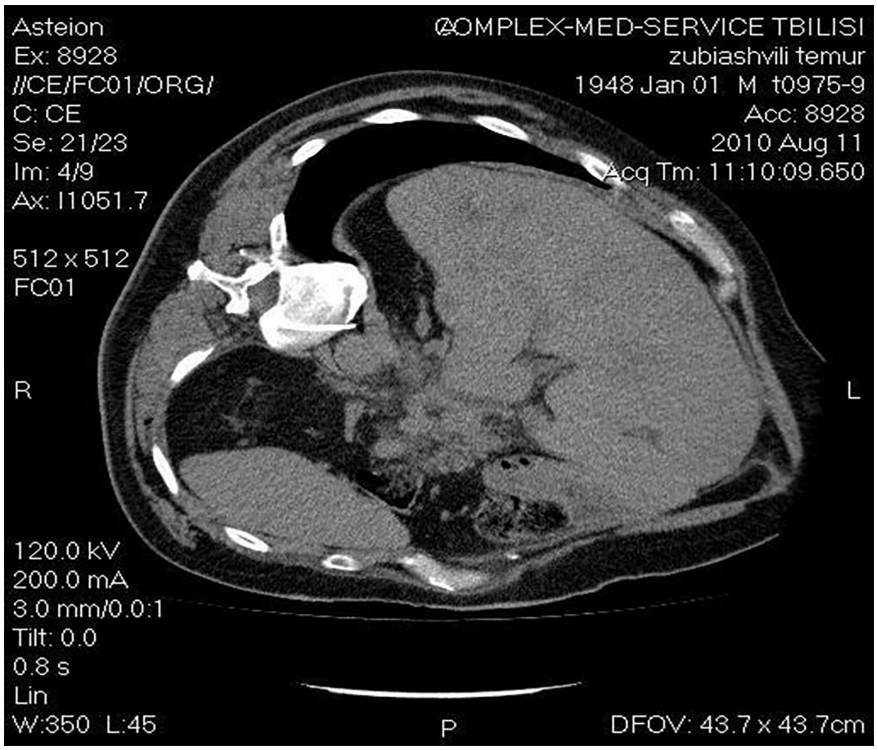

Fig. 4. *Needle position between intervertebral disc and aorta*

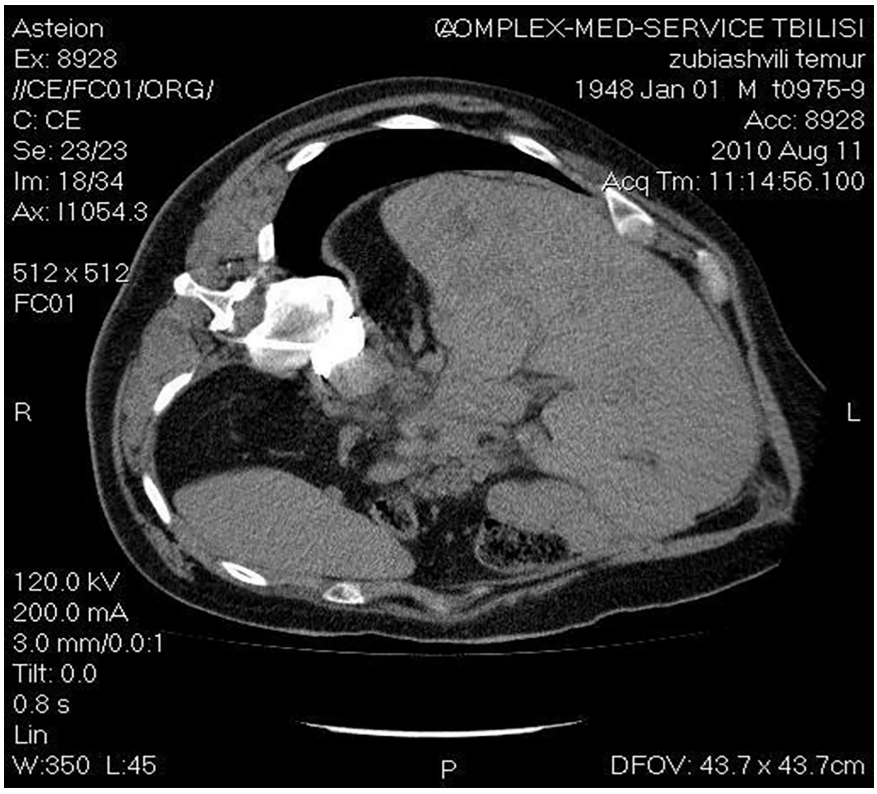

Fig. 5. *Contrast spread between intervertebral disc and aorta*

Case 2. 62 years old male with gastric cancer and severe intractable abdominal pain due to cancer recurrence after radical partial gastrectomy. For pain treatment patient received 120 mg morphine hydrochloride injections daily, pain score 6-8 VAS. After receiving of informed consent 6 h fasting and 500.0 ml normal saline infusion T12-L1 computed tomography guided transdiscal splanchnic nerve block performed in patient prone position under sterile conditions and standard ASA monitoring. After marking of injection site at left side from vertebral column and deep infiltration with 1% lidocaine, a 22G 20 cm Chiba needle had been inserted. 0.1g cefazolin injected intradiscally. Intervertebral disk penetrated centrally and needle position confirmed between intervertebral disk and aorta (Fig. 4). Contrast spread was equal on both sides between aorta and L1 vertebra (Fig. 5). Pain relieved after injection of 5 ml 2% lidocaine and 15 ml 95% alcohol. After procedure pain score decreased to 3-4 and patient was needed in 10 mg morphine hydrochloride and 150 mg lyrica daily lifetime (9 weeks).

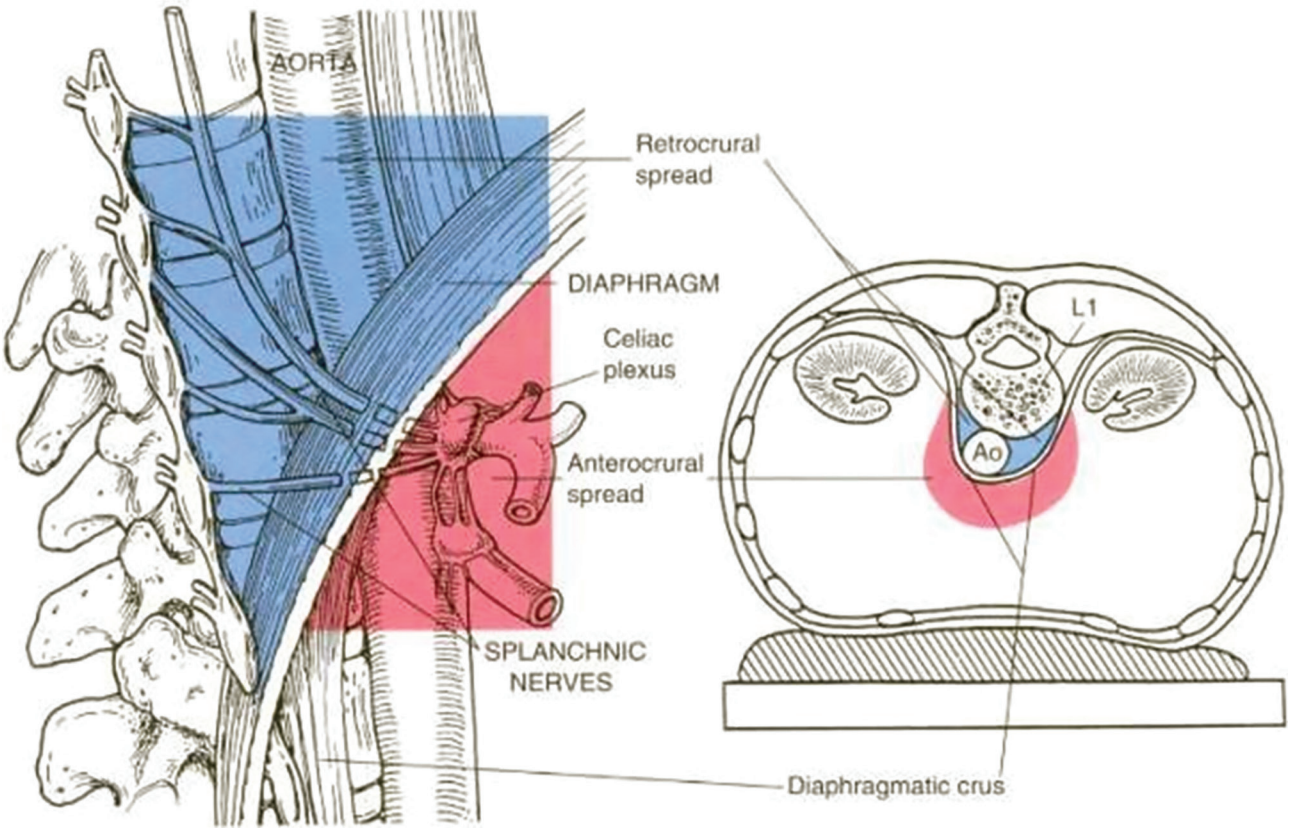

Fig. 6. *Retrocrural and transcrural (anterocrural) block of splanchnic nerve/ celiac plexus. From: Brown D: Atlas of Regional Anesthesia, 4th edition*

Discussion

Nearly 8% of cancer pain patients may need in interventional pain treatment, which can be performed by chemical (alcohol or phenol) or physical (cryodestruction, radiofrequency, surgery) destruction of involved nerve/plexus [2,3]. Neurolytic effects typically last 3-6 months, pain recurrence might be due to progression of tumor or nerve regeneration [2]. For this needs splanchnic nerves/celiac plexus are the important targets. Autonomic innervation via these nerves/ganglions including the liver, gallbladder, stomach, pancreas, spleen, kidneys, small bowel, and the first two-thirds of the large bowel [4]. Splanchnic/celiac plexus block is indicated for intractable cancer related abdominal pain, which is not responsive for conservative treatment. It was first performed via percutaneous approach by Kappis at 1914 [5]. Types of this block can be classic retrocrural and antecrural, schematically they are illustrated on Fig. 6 [6]. Effectiveness of splanchnic/celiac plexus block is very high – up to 95%, some authors suggesting, that retrocrural block is preferable, because celiac plexus has a great anatomic variables and it can lead to the block ineffectiveness [7,8,9,10,11,12]. Splanchnic/celiac plexus block can be performed using different image guidance including ultrasound, CT, fluoroscopy, endosonography [12,13,14,15,16,17]. Procedure can be provided using anterior or posterior, transaortic, transdiscal or paravertebral approaches, using single or double needles [7,8,18,19]. For neurolysis alcohol or phenol solutions of different concentrations can be used, some authors suggesting, that alcohol is more effective, then phenol [9,15,20]. Generally all methods and approaches of performing of the procedure are safe and major complications (pneumothorax, paraplegia, epidural spread, infection, bleeding or damage of organ) are rare [4,21].

Transdiscal splanchnic/celiac plexus block is a relatively new technique. It can be performed using fluoroscopy or CT guidance. In both cases, compared to the paravertebral technique, injection point which is proximity to midline and needle trace reduces the risk of pneumothorax and possible organ injuries [16,12].

In one case of transdiscal splanchnic neurolytic block, we have used two needles, because needle penetrated disk marginally but in another case, when needle penetrated disk centrally, one needle was sufficient. In first one has used phenol and unilateral repeated block with alcohol was needed.

According to Fujie et al for transdiscal neurolytic splanchnic nerve block retrocrural injection of 8-12 ml absolute alcohol is sufficient [22]. Tewari et al. examined the differences between retrocrural and transaortic neurolytic CPB for pain relief in patients with upper abdominal malignancy and found that the retrocrural technique provided superior pain relief when compared to the transaortic technique Plancarte et al had been shown

the effectiveness of retrocrural transdical approach and concluded that this is superior then transaortic block, because celiac plexus anatomy is variable [7,8].

Both of our cases of transdiscal splanchnic neurolytic block were safe and successful. Repeated block was needed due to one sided insufficient block after phenol injection. In this case one sided repeated alcohol injection was sufficient for pain relief. In another case by the single needle transdiscal alcohol injection received improvement of painful condition.

Conclusion

Computed tomography guided percutaneous transdiscal splanchnic neurolysis is safe and effective treatment tool for pancreatic cancer pain relief. It can be effectively performed by the single needle transdiscal retrocrural injection of alcohol. Right sided incomplete block is related to incomplete neurolisis after phenol injection. In this case one sided repeated alcohol neurolitic block was helpful.This type of treatment can be recommended for complex management of intractable cancer related upper abdominal pain.

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