

# Unilateral recanalisation of hypogastric artery after ligation for postpartum haemorrhage treatment

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## Abstract

*Internal iliac artery ligation has been a valued method of treating postpartum haemorrhage saving women's fertility. It is considered as an irreversible procedure with no possibility of recanalisation. The manuscript concerns a case of unilateral recanalisation of the hypogastric artery after ligation as a method of postpartum haemorrhage treatment. Material: 24 year old woman with body mass index 28 kg/m<sup>2</sup> with ligated internal iliac arteries due to postpartum haemorrhage. In the place of surgical ligation, the partial recanalisation of the internal iliac artery was noticed. Five mm under the narrowing there was found the telectasis of vessel's diameter with turbulent blood flow and contrast back. There can occur partial recanalization in the ligated internal iliac artery after obliteration in postpartum haemorrhage treatment. Exfoliation of endothelium shows that the process of recanalisation may be a risk factor of further complications of internal iliac artery ligation.*

**Key words:** hypogastric artery, recanalisation, postpartum haemorrhage.

## Introduction

Internal iliac artery ligation (IIAL) has been a valued method of treating postpartum haemorrhage saving women's fertility [1]. It is a fact that IIAL does not affect the activity of the pelvis minor's organs or fertility and that complications seem to occur rarely. Complications that may occur include changes in the ovarian blood flow and the loss of ovarian reserve [2, 3]. Until now, IIAL was considered as an irreversible procedure with no possibility of recanalisation.

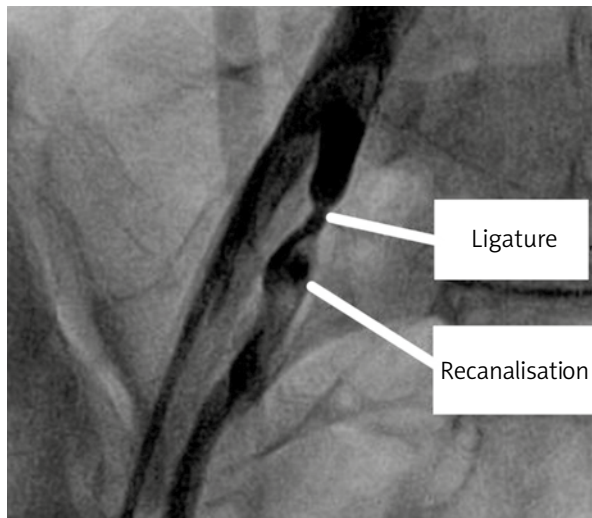
The manuscript concerns a case of unilateral recanalisation of the hypogastric artery after ligation as a method of postpartum haemorrhage treatment.

## Case report

Patient: women, age: 24 years, body mass index: 28 kg/m<sup>2</sup>. During the labour there was a postpartum haemorrhage caused by uterine atony. There was blood loss > 1500 ml during 60 min and a decrease of haematocrit from 37.9 to 23.1. Bilateral internal iliac artery ligation was performed using a transperitoneal technique and absorbable stitches (polyglactin 910) leading to haemostasis. The effectiveness of the artery ligation was confirmed immediately after the surgery by the use of Doppler ultrasound which revealed no blood flow beneath the place of banding. Four units of erythrocyte mass were transfused. Six months after the artery banding, during the ultrasound control study there was found turbulent blood

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**Photo 1.** Angiogram of right iliac arteries – partial recanalisation of the right internal iliac artery

flow in the right internal iliac artery beneath the place of ligation. Digital angiography and angio CT of the internal iliac arteries were done.

By the Selinger technique the catheters type Pig Tail and JGFJ 4,0 were applied to the abdominal aorta and next to the common right iliac artery. The intravenous non-ionic contrast agent density 550 mg/ml in a 3 ml dose was supplied and afterwards by the entire dose of radiation 286 mG the flow in the common, external and internal iliac arteries was rated. The measurement of the iliac diameter was made using digital quantitative angiography (QCA). Overall rating of the endothelium was done by computed tomography (angio CT) with the use of maximum intensity projection with the trigger level of 120 j.H.

In the place of surgical ligation of the vessel, the partial recanalisation of the right internal iliac artery was noticed. 5 mm under the narrowing there was found the telectasis of vessel's diameter with turbulent blood flow and contrast back (Photo 1).

The results of QCA: stenosis of the vessel: 17.37 mm beneath the division of the right common iliac artery; diameter of the vessel before stenosis: 5.60 mm; diameter of the stenosis: 2.41 mm; diameter of the vessel beneath the division measured in the widest place: 6.12 mm.

The turbulent blood flow in the right internal iliac artery proves the fact that the idiopathic recanalisation of the hypogastric arteries after the

ligation in postpartum haemorrhage treatment is possible.

## Discussion

The safety assessment of ligation of internal iliac arteries in postpartum haemorrhage treatment is high [4]. However, most of the investigations which have measured the distant effect of IIAL were based on from a few to several clinical cases.

In the pelvis minor there are a dozen vessel junctions which theoretically should protect tissues from ischaemia after IIAL [5]. The question is whether the hemodynamic competence of collateral circulation is the same in every woman after IIAL. It has been reported that there exist some complications after IIAL such as urinary bladder necrosis, peripheral nerve ischaemia or gluteal compartment syndrome [6] which contradict no effect of IIAL on pelvic organs' activity.

The digital angiography performed in the patient in this study indicates the telectasis of the vessel's diameter of 0.52 mm, which may be the result of post-stenotic dilatation with no damage of the endarterium. According to the continuity of blood flow, it should come faster through the stenosis. Nevertheless, the contrast back may be the proof of exfoliation of the endothelium and diverticulum creation. In order to diversify it, cross-sectional angio CT using maximum intensity projection (MIP) technique at the level of the artery's telectasis confirmed the exfoliation of the endothelium at the distance of 3 mm. The procedure shows the first case of recanalisation of the right internal iliac artery after ligation for postpartum haemorrhage. It is important that the recanalisation appeared only on one side whereas the ligation was done bilaterally by the same surgeon and with the same materials.

The exfoliation of the endothelium at the distance of 3 mm shown in the cross-sectional angio CT by the MIP technique is a risk factor of rupture of the arterial wall which may result in life-threatening retroperitoneal haemorrhage. There are some case reports of asymptomatic aneurysms in internal iliac arteries [7, 8]. It should be taken into consideration whether the presence of such an alteration does not indicate the use of stent graft implantation. The treatment of aneurysms using stent graft implantation is of high efficiency in cost-effectiveness analysis [9, 10]. Perhaps another technique of ligation such as clamps/tapes instead of sutures should be used.

## Conclusions

There can occur partial recanalization in the ligated internal iliac artery after obliteration in postpartum haemorrhage treatment. The presented fact that exfoliation of the endothelium can exist shows that the process of recanalisation may be a risk factor of further complications of internal iliac artery ligation.

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