

## Pregnancy after Bilateral Ligation of the Internal Iliac(Hypogastric) Arteries\*

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== 초 록 ==

### 양측 내장골동맥 결찰후의 정상분만

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내장골 동맥 결찰은 심한 골반장기 출혈시 환자의 생명을 구하는 방법이다. 양측 내장골 동맥 결찰후에 정상만삭분만은 동맥 결찰후에도 충분한 골반의 혈액 순환이 유지된다는 것을 나타낸다. 국내에서는 아직 보고가 되지 않은 양측 내장골 동맥 결찰후의 정상분만을 문헌 고찰과 함께 보고하는 바이다.

### Introduction

Ligation of the internal iliac arteries may be life saving in the control of uncontrollable severe pelvic hemorrhage.<sup>1)</sup> Ovulation and reproduction represents a high functional capacity of the female generative apparatus, a capacity that remains even after ligation of both internal iliac and both ovarian arteries. Most surgeons think of arterial ligation as akin to closing a valve in a pipe, depriving the distal portion of blood.

This is not correct insofar as ligation of the internal iliac artery just below the bifurcation is concerned. Burchell<sup>2)</sup> made a prolonged and intensive study of pelvic hemodynamics.

Birth of a living term-size child after bilateral internal iliac artery ligation would seem to be sufficient demonstration of an adequate

pelvic blood supply.<sup>3)</sup> There is no case report about woman who bore a normal child successfully after bilateral ligation of the internal iliac arteries in Korea. So, we report two cases of normal term pregnancy after bilateral ligation of the internal iliac arteries.

### Report of cases

#### Case 1

Mrs. W. M. Lee, 26-year-old gravida 1 was admitted to our delivery suit, Jan 13, 1981 in labor. After 12 hours of labor, she was delivered 2,730gm female baby by vacuum extraction after a pudendal block and median episiotomy. Soon thereafter she developed a vaginal hematoma and went into shock. Blood transfusions were begun. The hematoma was opened vaginally, but no bleeding point could be seen. Echyrosis on episiotomy site and venipuncture

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sites were developed with abdominal tenderness. The abdomen was opened. There was a large hematoma, dissecting beneath the retroperitoneal tissues and rising to the level of the bifurcation of the aorta.

It had begun to dissect into the bases of the broad ligaments and about 500ml of blood with clots in the peritoneal cavity. There was no laceration site at uterus. Both internal iliac arteries were ligated and the hematoma was removed transvaginally. No bleeding was continued. The patient made an uneventful recovery and discharged eleven days later.

On Feb 14, 1983 she was delivered 3,360gm female baby after uncomplicated labor at our hospital.

#### Case 2

Mrs. W. J. Choi, 23-year-old gravida 2, para 1, abortion 1, living 1 was admitted to our postpartum unit via emergency room on Mar 18, 1981. She was delivered a living 2,300 gm female baby at private clinic by vacuum extraction after a local infiltration and right mediolateral episiotomy, 11:00 PM, Mar 17, 1981. Soon thereafter she developed a large vaginal hematoma, so transferred to our hospital. On arrival to our emergency room, five hours after from delivery, B.P. was 110/70 and the pulse rate was 95. Pelvic examination revealed a large left vaginal wall hematoma and over adult fist sized right adnexal mass. Blood replacement was instituted.

The abdomen was opened. There were a large retroperitoneal hematoma extended from the base of urinary bladder to the base of broad ligaments and a small hematoma, about hen egg sized, at the retropubic space. Both hypogastric arteries were ligated. The retropubic hematoma was dissected, but slight bleeding was continued, so a penros drain was inserted and the abdominal wall was closed. After that vaginal hematoma was removed transvaginally. Eight hours after first operation, second laparotomy was done due to continuous hemorrhage from the suprapubic drainage site.

Bleeding was continued from the left infere vesical vein after endopelvic fascia was dissected. The left infere vesical vein was ligated and the abdominal wall was closed. In all, she received blood transfusions totalling 6,400ml. The postoperative course was uneventful and she was discharged on the eighth day. She revisited our OPD on Jan 1983 with pregnancy 18 weeks and was received routine antenatal check till June 1983. On June 25, 1983, because of the incomplete breech presentation, she was delivered by cesarean section of a normal male child weighing 3,300gm. The postoperative course was uneventful and she was discharged with her baby on the seventh day.

#### Discussion

Hemorrhage is the most frequent cause of maternal deaths, and a common contributor to puerperal death from other causes. Hysterectomy in the treatment of severe postpartum hemorrhage is, at best, a radical, undesirable and sometimes unsuccessful operation. The decision to perform a laparotomy is obviously a difficult one, but not as difficult as the decision to do a hysterectomy. There is a natural reluctance to subject an already anemic and frequently traumatized patient to a major surgical procedure. The additional strain of the arterial ligation is certainly less than that of a hysterectomy. Good judgement is imperative, and the decision to operate must be made early.<sup>1,4)</sup>

The advantages of uterine preservation in the young and those of low parity are obvious.<sup>4-6)</sup>

Internal iliac artery ligation is effective in control of hemorrhage from cervical lesions, from obstetric hemorrhage, and from gynecologic hemorrhage during and after operation when employed for demonstrative reasons in patients without fantastic distortion of normal anatomy, blood continued to flow from the severed uterine artery.<sup>2,6,7)</sup>

The most dramatic change in pelvic circulation following internal iliac artery ligation was the drop in arterial pulsation or pulse pressure. Since pressures after ligation are nearly identical in the internal iliac and the uterine artery (the pressure of the collateral flow) they were considered together. The average decrease in pulse pressure with iliac ligation was insignificant(14%) with the opposite side tied, considerable(77%) with the same side tied, and maximal(85%) with both side tied.<sup>2)</sup>

Blood pressure in the collateral system fell to some extent after iliac ligation. The mean pressure(one-third of the pulse pressure plus the diastolic pressure) was used to show the blood pressure decrease. The average drop in mean pressure of the collateral system with iliac ligation was 10% with the opposite side tied, 22% with the same side tied and 24% with both side tied. Ligation of the artery on the same side had nearly the same effect as ligation on the both sides. Blood flow was reduced 49% with iliac ligation on the same side and 48% with iliac ligation on the both sides.<sup>3,8)</sup>

Three pairs of arteries of small caliber, already present, and functioning, anastomose around the ligature site. The small diameter of the lumen inhibits rapid passage of quantities of blood and therefore damps out pulse pressure distally. Ligation produces distal hemostasis because a clot can form and remain. There is no surging pulse pressure to blow it off. On the other hand, there are always adequate quantities of blood in the pelvic arteries after ligation.<sup>2,8)</sup>

Birth of a living term-sized child after bilateral internal iliac artery ligation would seem to be sufficient demonstration of an adequate pelvic blood supply.<sup>3,4)</sup>

This life-saving measure should be demonstrated whenever possible throughout the training period, but without the destruction of normal tissue. The internal iliac arteries can be readily exposed during many pelvic operations and

ligature techniques demonstrated, without actually ligating the vessels. In most critical situations in surgery, decision to perform a given procedure be more important than who perform.<sup>1,9,10)</sup>

### Summary

Ligation of the internal iliac arteries may be life saving in the control of uncontrollable severe pelvic hemorrhage. Ovulation and reproduction represents a high functional capacity of the female generative apparatus, a capacity that remains even after ligation of both internal iliac and both ovarian arteries.

Birth of a living term-sized child after bilateral internal iliac artery ligation would seem to be sufficient demonstration of an adequate pelvic blood supply. Two cases of normal term pregnancy after bilateral ligation of the internal iliac arteries are reported and literatures are reviewed.

### Reference

1. Robert, A. Sack: Bilateral internal iliac a. ligation to control of obstetric and gynecologic hemorrhage. *Am. J. Obstet. Gynecol.*, 36 : 493, 1973.
2. Burchell, R. C. : Internal iliac artery ligation Hemodynamics. *Obstet. Gynecol.*, 24 : 737, 1964.
3. Mengert, W.J., and Burchell, R.C.: Pregnancy after bilateral ligation of the internal iliac and ovarian arteries. *Obstet. Gynecol.*, 34 : 664, 1969.
4. O'Leary, L. A., and O'Leary, J. L.: Uterine artery ligation in the control of intractable postpartum hemorrhage. *Am. J. Surg.*, 80 : 12, 1960.
5. 김성환, 이동준, 윤성도, 서영옥 : 지혈곤란한 골반장기 출혈시 내장골 동맥 결찰술에 대하여. 대한 산부인과 학회지, 23, No. 8, 1980.
6. 이병덕, 김광선, 김용훈, 신 욱, 박찬규, 박현

- 모 : 산부인과 영역에 있어서의 내장골 동맥결찰. 대한 산부인과 학회지, 21 : 467, 1978.
7. Pritchard, J. A., and Paul, C. M. : William's Obstetrics. 16th ed., Appleton Century Comp., New York, p. 873, 1980.
8. 김성일 : 자궁동맥 및 난소동맥 결찰이 추후 임신에 미치는 영향에 관한 실험적 연구. 대한 산부인과 학회지, 23, No. 8, 1980.
9. Mattinglt, R. F. : Telinde's Operative Gynecology. 5th ed., J. B. Lippincott Co., Phil., p. 79, 1977.
10. Shafiroff, B., et al. : Bilateral ligation of hypogastric A. Am. J. Surg., 98 : 34, 1969.