

INTERNAL ILIAC ARTERY LIGATION FOR UNCONTROLLABLE HAEMORRHAGE FOLLOWING ACUTE PELVIC TRAUMA

(A Case Report)

by

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Introduction

Ligation of internal iliac arteries is considered to be safe procedure. A number of authors in recent years suggested its prophylactic use in anticipation extensive pelvic dissection, particularly before radical pelvic surgery for carcinoma cervix (Brunschwig 1965; Reich *et al*, 1965; Frank Le 1966; Burchell *et al*, 1966).

Occasionally, massive uncontrollable pelvic haemorrhage may call for bilateral ligation of internal iliac arteries often as a life saving procedure in a critically ill patient (Shinagawa 1964; Reich *et al*. 1965; Radman 1965; Isaacs 1966). In obstetrics, cases included are ruptured uterus and postpartum haemorrhage, whereas in gynaecology the indications are:

(i) Spontaneous pelvic haemorrhage usually from an advanced case of carcinoma cervix.

(ii) Incidental injuries of blood vessels, particularly during radical pelvic surgery and,

(iii) Accidental slipping of ligature of blood vessels in the postoperative phase particularly following abdominal or vaginal hysterectomies.

Uncontrollable haemorrhage following acute pelvic trauma may rarely indicate ligation of internal iliac arteries (Seavers *et al* 1964). Massone (1966) however, after analysing the data obtained from questionnaire sent to 137 gynaecologists of different parts of the world concluded that "therapeutic ligation of the hypogastric arteries does not seem to be as popular a procedure as theoretical considerations might warrant. Perhaps this is due to the fact that its real indications are relatively rare, hence experience with the operation is limited. Below we describe an unusual case of gynaecological injury in a pregnant woman, who sustained multiple fractures of bony pelvis, causing wide displacement, disruption of vagina and pelvic floor, there by producing profuse haemorrhage.

Case Report

Mrs. S.B., a 30 years old local adivasi, eighth gravida, carrying about 20th week of pregnancy, was admitted to the Bokaro General Hospital of 26-11-1972 with extensive pelvic injury, profuse vaginal bleeding and profound shock. It was reported that she had sustained the injury while carrying a heavy log of wood on her head. She suddenly slipped and fell down on slopy ground. The whole log came over her lower abdomen and shattered her pelvis anteriorly. The patient remained unattended in that condition in a pool of blood for nearly two hours and was finally carried to our hospital almost three and half hours after the injury.

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On Admission: On preliminary examination the patient was found to be semiconscious, with profound shock and imperceptible pulse, B.P. 60/?, pallor + + +, respirations 36/min. There was no evidence of any external injury other than slight ecchymosis of the lower abdomen. The pubic region looked flat with a wide gap felt in that area. The uterus was palpable upto umbilicus and vagina was full of blood clots.

The patient was rushed to the intensive care unit and an immediate attempt was made to resuscitate the patient with rapid fluid replacement, cortisone and oxygen inhalation. Within a few minutes the B.P. rose to 80 mm. of Hg. but again dropped to 60 mm. of Hg. with another bout of bleeding.

Examination Under Anaesthesia: The patient was therefore, taken to the operation theatre and examination under anaesthesia revealed that there was a big lacerated wound in the vestibule. The whole of the anterior vaginal wall was avulsed with the urethra completely lying loose in the vagina. Multiple small pieces of broken pubic bone were seen coming through the vestibular wound. The blood clots inside the vagina were cleared and two deep transverse vaginal lacerations at its lower half were evident; one at 9-O'clock and another extending almost whole of the left side upto the post vaginal wall and perineum. The exploring finger could easily be pushed high into the pelvis through the left paravaginal space. The urethra was fixed and a rubber catheter was passed. Clear urine drained, indicating that the bladder was not injured. X-ray of the pelvis revealed comminuted fracture of the superior and inferior rami of left pubic bone along with dislocation and diastasis of symphysis. Fracture of the right ala of sacrum was also evident with upward displacement of right side of the pelvic ring (Fig. 1).

Operation: Immediately the abdomen was opened by midline incision extending down to the torn vestibule, and small pieces of bone and blood clots were removed. Besides a moderate sized haematoma in the right broad ligament, there was extensive laceration, right from the space of Ritzius to the left pelvic wall and

base of left broad ligament with multiple arterial bleeding points. By extraperitoneal approach the haematoma in the right side was drained. Since there was extensive degree of arterial laceration, our every attempt for direct haemostasis failed. Therefore, for an indirect haemostasis, the peritoneum was opened, a quick total hysterectomy was performed, followed by bilateral ligation of the common trunk of internal iliac arteries proximal to the anterior and posterior division with No. 2-0 silk. No doubt immediately there was marked reduction of blood loss, but widespread ooze still continued from the numerous collateral circulation. Extraperitoneally pelvis was packed with Gelfoam and subsequently with several pieces of roller gauze, the end of which was brought out through the lower abdominal wound.

The vestibule was repaired and urethra was anchored to its place. The vaginal laceration was repaired as neatly as possible and finally vagina was tightly packed. A continuous drain was left in the bladder for 7 days. Four units of blood was transfused including three in the operating theatre.

Post-operative recovery: The patient was given a tight elastic bandage around the pelvis to prevent further separation of the two fractured halves and she was advised to lie on her sides. She was allowed to walk after 12 weeks. The postoperative period was uneventful. The vaginal wound healed up completely and there was no evidence of stress incontinence of urine.

Discussion

Injuries of the female reproductive organs are most often related to childbirth, although direct trauma from some sharp object or from coitus or rape, resulting in vaginal laceration are not uncommon. Crushed injury of the pelvis, however, may occasionally damage the genitourinary system indirectly (Elias 1950; Holdsworth 1963; Braunstein *et al*, 1964). Such traumatic wounds are comparatively few in females (Quast *et al*, 1964). In a survey Milan *et al*, (1963)

observed that 79 per cent pelvic fractures in female in America were from car accidents. In our country gynaecological injuries from vehicle accident are rare, and Chaturvedi (1972) reported a case of vaginal detachment in a girl of 11 years following a bus accident.

In this case, however, the mode of injury was somewhat unusual. A severe direct blow due to the fall of a heavy log, which she herself was carrying, shattered the left set of pubic rami with fracture of the right ala of sacrum, thus, transecting the protective pelvic ring in two places (Malgaigne fracture). This caused wide separation of symphysis and undue displacement of the two halves resulting in extensive laceration of the pelvic floor, vagina and vestibule; severe arterial damage caused profuse pelvic haemorrhage. Marked vascularity and looseness of the pelvic subcutaneous tissue due to pregnancy predisposed to further haemorrhage. The blood loss was so profuse that even with rapid replacement of fluid balance could hardly be achieved.

Our initial attempt for direct haemostasis did not work since there were too many bleeding points over wide area, right from the retropubic space, bladder neck, vestibule, paravaginal tear, and pelvic floor. Extensive laceration and altered anatomy made the task more difficult. Here time is a single important factor, since further attempt could have been not only futile but fatal. Ligation of the internal iliac arteries on the other hand, proved to be a simple, quick and effective procedure. This is also safe and does not jeopardise the function of the bladder, rectum, or genital organs Shinagawa (1964) reported a case of delivery of an infant weighing 3350 Gms, 16 months after bilateral extraperitoneal ligation

for an uncontrollable postpartum haemorrhage.

Even after the ligation of the main pelvic arteries blood continued to ooze from widespread area, indicating the extensive interlacing net work of the pelvic anastomosis (Seavers *et al* 1964). Beside, (i) ovarian arteries collaterals develop from (2) inferior mesenteric arteries through superior haemorrhoidal, (3) external iliac arteries through inferior epigastric, (4) middle sacral, (5) lower lumbar and (6) through the circumflex and perforating branches of the femoral arteries (Frank 1966). By serial pelvic aortogram after internal iliac ligation, Burchell and Olson (1966) demonstrated only three principal collateral circulation namely, lumbar-iliolumbar middle sacral-lateral sacral, superior-middle haemorrhoidal. They further indicated that collateral circulation functioned immediately after ligation and did not increase with time.

Fracture of the pubic rami, ischium, separation of symphysis or severe multiple fractures mostly account for injury of lower urinary tract, particularly the bladder (Barnes *et al* 1968). From 2 to 25 per cent of all pubic fractures are associated with such injuries (Todd 1964). When the bladder is elevated or distended the injury is more likely. Similarly, when the uterus tends to enlarge and rise beyond the pelvis it is more susceptible to trauma (De Lee 1904; Morrison *et al*, 1945; McClure 1954; Bochner 1961; Elias 1950; Schoeneck 1963. Fortunately, however, in this cases the enlarged gravid uterus and the bladder escaped injury.

Barnes and Holzman (1968) reviewed the literature in respect of gynaecological injury and recommended hysterectomy only when the uterus was damag-

ed. Such a case of extensive pelvic injury but with an intact gravid uterus and bladder could not be found in available literature.

The question, therefore, arises of an hysterectomy was inevitable in this case? Could such an undamaged uterus have been left undisturbed with the expectation to continue upto term?

It is indeed very doubtful if after such severe trauma and ligation of both the internal iliac arteries the pregnancy could continue upto term. Moreover, an abortion in the immediate postoperative phase in this case with its risk of sepsis, if not from haemorrhage, could have been fatal.

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