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A Case For Unilateral Internal Iliac Ligation In Controlling Bleeding From Pelvic Injuries. Will It Avoid Uncharted Complications Of Bilateral Procedure?

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Abstract:

Introduction

Bilateral Internal iiliac ligation(BIIAL) is one of the last and desperate maneuver to stop bleeding from pelvis and save life. BIIAL is usually required to control post partum haemorrage but also employed in procedures such as bleeding from pelvic tumours and fractures of pelvis. Short term Complications of this procedure are described in literature but data regarding long term complications are scarce. The possibility of long term term complications affecting quality of life particularly those concerning sexual functions has led to consider unilateral internal iliac artery ligation(UIIAL) as an option when this alone with packing of pelvis can achieve satisfactory control of bleeding.

Methodology

In a case series of 17 Patients, soldiers of the Sri lanka Army, with fractures involving hemipelvis following penetrating trauma author has managed to achieve haemostasis with UIIAL and packing which was removed 48 hours later at a second surgery.

Results

All patients in the study has stopped bleeding from pelvis in 48 hours. Further follow-up of in hospital stay and post-operative course was not possible due to circumstances surrounding war.

Conclusion

In the absence of clear evidence pertaining to long term complications of BIIAL on quality of life, UIIAL appears to be a valid option in selected cases when bleeding is almost exclusively originating from one half of pelvis

Introduction and scope

Bilateral Internal iliac artery ligation(BIIAL) is essentially a maneuver of retreat for a surgeon. Although of modest difficulty technically the procedure is confounded by the advanced shock state, physiological derangements, multitude of ongoing resuscitation activities, association with injuries to other organs and the very desperateness of the situation (1). It has been successfully practiced since 1894 (2). Bilateral internal iliac ligation for postpartum hemorrhage is the most widely encountered situation form and obstetric and gynecological indications predominate among reasons for BIIAL. Lynch et al list gunshot wounds to pelvis and uncontrollable bleeding in pelvic fractures among 11 indications for BIIAL (3).

BIIAL by itself is often not adequate to control hemorrhage and pelvic packing with gauze removed after 24-48 hours of stabilization of physiology at an Intensive care unit (Damage control surgery) may be required particularly in traumtic presentations (4,5). In addition to

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components of damage control resuscitation in trauma Angio-embolization, External fixator devises, rarely internal fixators are employed before surgeon resolves to BIIL.

BIIAL is overall a well-tolerated procedure owing to rich collaterals in pelvis (6). However it is tainted by some short term and few described long term complications. Early complications reported include failure to control haemorrage, injury to common iliac artery, injury to internal iliac vein, ureteric Injury, massive gluteal necrosis, altered sensation in gluteal region, sloughing of bladder mucosa and necrosis of scrotum (5,7,8). Failure to control haemorrage can be mostly attributed to circumstances such as advanced state of shock and coagulopathy than to the failure in technique (4,9). There are reports about pregnancies occurred following BIIAL (10). literature published on the subject rarely cover less than conspicuous possible long term complications of BIIAL affecting quality of life such as incidence of deficiencies in sexual function and abnormalities in bladder and bowel functions.

The above deliberations raises an important issue in the mind of trauma surgeon- the possibility of unilateral internal iliac artery (UIIAL) in hemi-pelvic injuries which can be expected to minimize short term and long term complications offering an assurance that the patient will live a reasonably normal quality of life afterwards!

Description of Case series

Injuries to hemi-pelvis are common among battle casualties which allow high velocity localized penetrating injuries to the area not covered by body amour. It is rare in civilian trauma which involve blunt mechanisms affecting pelvic ring in tote. Author in his experience as a trauma surgeon in a forward military hospital with Sri Lanka Army faced uncontrollable hemorrhage from injuries to hemi-pelvis resulting from high velocity penetrating injuries caused by shrapnel in 17 patients between December 1999 and May 2001. All were fit male soldiers with their age ranging from 19 to 31 years. 13 of them had associated injuries to hollow vicera .Those with injuries to bilateral pelvic parts were excluded form discussion as well as those with major injuries to other parts of body. Young soldiers were in shock after bleeding from combinations of open wounds involving hemi pelvis. They were managed with certain components in Damage Control Resuscitation which was not fully established at the time (4). External fixation was technically rarely feasible and internal fixation was neither practical nor recommended. This situation with associated injury to other organs , scarcity of time for deliberation challenged by prevailing disaster situation caused by overwhelming casualties forced the hand of surgeon towards early Laparotomy and Internal iliac artery ligation if initial attempts at hemostasis using diathermy, ligatures, packing fail to succeed.

Having followed BIIAL as the last measure to control pelvic hemorrhage in the early career author decided to use UIIAL in above selected cases when mid pelvis and one half was spared of injury (3). Rationale was to do minimum necessary and avoid disruption of nature's bilateral blood supply with the intension of minimizing immediate and long term complications. This procedure is much less favored by Obstetricians and gynecologists which is not surprising as their areas of troubleshooting rarely confined to one side of pelvic cavity (3). All 17 patients often required gel-form packing followed by gauze packing and proceeded to intensive care stay for 24 to 48 in line with damage control surgery. UIIAL had controlled bleeding in 16 cases and one required reopening in 12 hours due to continuing hemorrhage which subsequently settled. The patients were followed up until they had definitive surgery from which all of them recovered. Subsequent follow up of In-hospital stay or their post-discharge course was

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not possible due to circumstances surrounding wartime.

Above case series make it apparent that UIIAL is at least as effective as BIIAL in controlling acute hemorrhage from selected cases where damage is from a penetrating injury and is confined to hemi pelvis. The main rationale for ligation of arteries to achieve hemostasis is that by reducing pulse pressure in pelvic vessels making arterial pressure close to that of veins it allows formation of clots in bleeding vessels. UIIAL decreases pulse pressure by 77% while BIIAL reduce it by 85% a marginal difference which supports the use of less extensive UIIAL if it can achieve the purpose (8). Logically this is expected to minimize short term and long term complications of the procedure with possible beneficial effects on quality of life. It is important to note that extensive studies need to be performed on those with arterial ligation following trauma as Obstetric and gynecological patients form a population quantitatively and qualitatively different raising questions on the validity of comparisons.

Conclusion

The employment of unilateral internal iliac artery ligation in selected cases from penetrating trauma to pelvis appears to be a successful option with logically less complications than BIIAL. Further studies with a view to confirm its success in hemostasis, range of scenarios the technique is employable and risk of complications compared to BIIAL may have benefits on morbidity following this procedure performed under desperate circumstances.

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