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Surgical Incision Simple Abdominal Drain (SISA Drain) in Obstetrics and Gynaecology Practice in Low Resource Settings to Reduce Morbidity

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ABSTRACT

During the performance of some obstetric and gynaecologic procedures it may be impossible to achieve satisfactory haemostasis and the surgeon wishes to monitor intraabdominal potential blood loss, additionally there may be possibility of urine leakage from the bladder or ureter, or potential accumulation of other fluids in the pelvis and abdomen at the end of the procedure. In any such situation, consideration and selection of a suitable and effective method on how to drain the pelvis and abdomen using existing abdominal drain types or packing the abdomen is made. SISA drain is an option to consider for use in obstetrics and gynaecology following such complicated operative procedures to prevent accumulation of blood, other fluids and air in the pelvis or lower abdominal cavity. Failure to recognize the need for an intervention such as use of an abdominal drain would result in the need of relaparotomy to evacuate accumulated intraabdominal or pelvic fluids with subsequent associated morbidity or mortality. The SISA drain is an effective, cheap and readily available option in low resource health facilities. This paper discusses prophylactic use of abdominal drains in obstetrics and gynaecological practice and describes the application of Surgical Incision Simple Abdominal drain (SISA drain) using existing sterile large(2000mls) urine drainage/collection bag during difficult and complex obstetrics and gynaecological procedures to reduce morbidity in low resource settings. In conclusion in low resource settings, understanding and ability to adapt to use some simple applications of cheap devices like the SISA drain can contribute to reduction in morbidity which may prevent some mortalities whiles saving precious and scarce resources.

Keywords: SISA drain; abdominal drain; relaparotomy; abdominal packing; haemoperitonium; ascites.

INTRODUCTION

Surgeons would usually want the best post-operative outcomes whenever they are performing a surgical procedure on a patient. However, some complications may arise due to the difficult and complex nature of the surgical procedure being performed despite all the efforts that are made to avoid such complications because of high risk preexisting complications associated with the condition being operated. Studies in eastern Democratic Republic of Congo and Yaoude in Cameroun found that 2.4% and 3.6% respectively of patients required relaparotomy because of post-operative early complications after an initial abdominal surgery [1,2]. Since the higher burden of abdominal operations in most hospitals in developing countries is in obstetrics and gynaecology, complications requiring relaparotomy is common. Obstetrics and gynaecological operations constituted the most frequent (46.67%) of the relaparotomy cases in a study done in eastern Democratic Republic of Congo [1]. Very good surgical training, surgical experience, skill, and use of some preventive measures minimizes such post-operative complications that would require relaparotomies.

Use of abdominal drains to drain the pelvis and lower abdomen is a useful monitoring measure that could prevent accumulation of blood and other fluids or help to make early decision about the need for relaparomy to reduce morbidity related to the obstetric and gynaecological condition or complication arising during the primary abdominal procedure or during a relaparotomy.

What is an abdominal drain?

An abdominal drain is a medical device used in surgical procedures to drain and prevent accumulation of fluids or air in the abdominal cavity. The closed abdominal drains used in the peritoneal cavity have a flexible tube with an attached drainage or collection bag. Popular types of Abdominal drains used in well-resourced settings in surgical practice include the soft and flexible tube Penrose drain, the closed-suction Jackson-Pratt drain and the silastic Blake drain.

The use of abdominal drains is not limited to obstetric and gynaecological procedures; majority of which are performed in the female pelvis and lower

abdominal cavity but also following surgical procedures that are performed on organs in the mid and upper abdominal cavities.

Are abdominal drains out of fashion?

Wide spread use of abdominal drains in modern day surgical practice is controversial [3]. This is partly due to availability and use of good antibiotics, better hemostatic techniques, hemostatic materials and new surgical techniques. Additionally, there has been improvements in surgical training and competencies in many parts of the world. In spite of all these, prophylactic use of abdominal drains still has a meaningful place and are still relevant for reducing morbidity and preventing mortality [3]. Prophylactic use of abdominal drains can prevent post-operative complications which are still high in low resource settings due to existing gaps in improvements in surgical practice.

Generally, in any setting, indications for prophylactic use of abdominal drains in obstetrics and gynaecology may include situations in which following a surgical procedure in the pelvis or abdominal cavity it has been impossible to achieve perfect haemostasis, where there has been infectious contamination in the abdominal cavity or spillage of bowel content, or risk of urine leakage from the bladder or ureters and expectation of ascites. The prophylactic use of abdominal drains remains relevant in pelvic or abdominal procedures as long as these indications and many more remain valid in surgical practice.

Is abdominal packing a better alternative to abdominal drains?

Abdominal packing in minimizing blood loss where perfect haemostasis has not been achieved is still practiced by some surgeons to date as an alternative to the use of an abdominal drain. Several large sterile abdominal packs used to pack the bowels and omentum during laparotomy are used to pack over the bleeding areas usually under tension when haemostasis is unsatisfactory during obstetrics and gynaecological operations. It is scheduled for removal usually 24-72 hours at relaparotomy after the primary intraabdominal surgery that required the packing. Relaparotomies are usually associated with higher morbidity and mortality [4,5,6].

AIM

This paper discusses the prophylactic use of abdominal drains in obstetrics and gynaecological practice and describes the application of Surgical Incision Simple Abdominal Drain (SISA drain) using existing sterile large(2000mls) urine drainage/collection bag during difficult and complex obstetrics and gynaecological procedures to reduce morbidity in low resource settings.

What is the Surgical Incision Simple Abdominal Drain (SISA Drain)?

SISA drain is a passive closed abdominal drain techniques using a medical device- the sterile large (2000mls) bedside urine drainage/collection bag to drain fluids from the lower abdomen and pelvic cavity aiming to reduce post-operative morbidity in low resources settings following a difficult operative obstetrics and gynaecological procedure. The type of sterile urine drainage/collection bag used is cheap, readily available and would be simple to apply/install in many low resource health settings. The drainage tube usually exits the abdomen through the surgical incision made on the abdominal wall for entry into the abdomen to perform the surgical procedure. SISA drain can be used for prevention of post-operative morbidity in low resource areas. The lead author of this paper has used SISA Drain for more than a decade in practicing in low resource areas in Ghana and it is gaining popularity. Since some obstetrician gynaecologist have also adopted it and many more may adopt it when there is an indication to use an abdominal drain, it is necessary to describe it and suggest some indications in which its application may be considered as an alternative to other abdominal drain methods or abdominal packing.

Use of the SISA Drain in Obstetrics and Gynaecology

The SISA drain can be considered for use in Obstetrics in any difficult and complicated surgical procedures especially during caesarean section in patients with coagulopathy and disseminated intravascular coagulation, severe intraoperative obstetric haemorrhage, caesarean section for severe pre-eclampsia with HELLP syndrome, where there is ascites or coagulopathy is expected after the primary abdominal procedure. Additionally, repeat caesarean section with severe adhesions and is been difficult to achieve perfect hemostasis, laparotomy for repair of ruptured uterus or peripartum hysterectomy due to complications of obstructed labour, sepsis from chorioamnionitis or obstructed labour, expectation of reactionary haemorrhage and massive blood loss with haemodilution.

The SISA Drain can be considered for use during Gynaecological procedures such as for patients with recurrent leiomyoma undergoing repeat myomectomy or hysterectomy with severe adhesions from previous surgery, extensive pelvic endometriosis with extensive adhesiolysis, Multiple and deep incisions on the uterus for extensive myomectomy or other extensive pelvic surgery where it is difficult to secure satisfactory haemostatis. In other situations, such as suspected or confirmed urological trauma, pelvic abscess and surgery for gynaecological tumours where blood, ascitic fluid or any other form of fluid is expected to accumulate. Useful for monitoring patients receiving therapeutic doses of anticoagulation before or immediately after surgery where the surgeon is concerned about possibility of development of haemoperitoneum.

The potential benefits of using the SISA Drain include reduction in relaparotomies due to accumulated blood and other fluids in the abdomen after the primary procedures for considering its use stated above. It is a better alternative to packing with abdominal towels and subsequent need for removal at relaparotomy, potentially may avoid multiple blood transfusions if relaparotomy is avoided, may

avoid exposure to multiple anaesthesia and possible complications. It improves post-operative recovery since no accumulation of blood or fluid occurs with associated morbidity and longer stay on admission, there is no separate incision or scar left on the abdomen when Surgical Incision Simple Abdominal Drain (SISA drain) is used.

Pictures illustrating the Surgical Incision Simple Abdominal Drain (SISA Drain)

Below are pictures illustrating the use of the SISA Drain in some patient who had obstetrics and gynaecological operations in the department of Obstetrics and Gynaecology at the Greater Accra Regional Hospital. The Greater Accra Regional Hospital is better resourced than many hospitals in Ghana. The commonest operation performed in the department is caesarean section while myomectomy is the commonest operation in the gynaecological theatre some of which have associated co-morbidities requiring use an abdominal drain.

Making the SISA drain using sterile large (2000mls) bedside urine drainage/collection bag

Perforating 3 or4 additional holes, 1.5-2cm apart on contralateral sides of the flexible drainage tube of the urine bag to improve the drainage capacity.

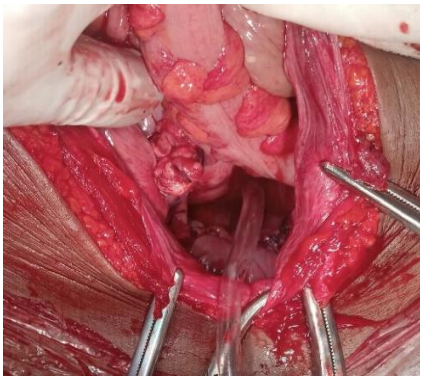
1. *Cutting off the connector or joint end of flexible tube to get a uniform open-end tube.*

2. *Perforating additional 3 or 4 sleek openings on the curved surface of the flexible drainage tube.*

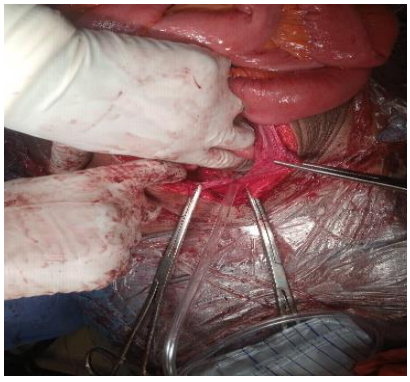
3. Inspecting the 1cm long, 1.5-2cm apart sleek openings made on the tube.

Pictures 4-6 showing the installation of the SISA drain through the midline and low transverse anterior abdominal wall surgical incisions.

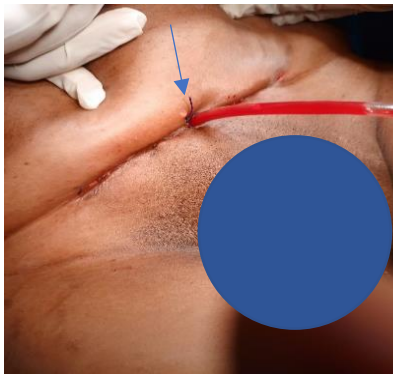
4.SISA drain is inserted into the pelvis to monitor bleeding in a patient after a difficult hysterectomy:



5. SISA Drain transfixed to parietal peritoneum at the base of surgical incision without piercing the tube.



6. SISA drain placed to monitor bleeding in a patient after adenomyomectomy.



The arrows in 6, 7, 8 and 10 are showing nylon or vicryl sutures used to transfixed the drain to skin to prevent it from falling out. Cutting of the suture and removal of the SISA drain in pictures 10-12.

10. The transfixed vicryl or nylon suture through the skin and the SISA drain is identified cut at time of removal.

11. Traction is applied to the SISA drain to remove it after the transfixed vicryl or nylon suture is cut off the skin.

12. Midline incision after the SISA drain is removed. This patient had extensive myomectomy.

The large bedside Collection bags with various fluids drained from the abdomen of four patients using SISA drain. Accurate amount in the bag should be determined using a calibrated dish or cup during emptying

Management of the SISA drain

Instructions on management of the drain is usually included in the operation notes including checking for its contents and emptying it on daily basis. The amount emptied is measured using a cup or dish labelled in milliliters and liters; this is usually less than what is labelled on the collection bag. The wound around the SISA drain is opened and dressed on the third day if it is intended to be maintained for more than 72 hrs. Early patient mobilization is encouraged with SISA drain to improve drainage. Removal of the SISA drain on 2nd or 3rd day is encouraged if the drainage is less than 100mls of fluid in the last 24hrs and there is no fear of some complication that requires the surgeon to continue to monitor. SISA drain is a closed drain and well secured with suture to the skin so it can be left in situ and adequately functioning for up to 7 days post operation if necessary. Removal of the SISA Drain can be done and patient discharged on same day.

DISCUSSION

At the end of a difficult or complicated open abdominal surgery in obstetrics and gynaecology, the surgeon may have some doubts about achievement of satisfactory haemostasis and possibility of development of haemoperitoneum or risk of accumulation of other types of fluids in the pelvis and beyond. Before closure of the abdomen, an abdominal drain may be left in situ or abdominal packing is used to compress the bleeding vessels. Use of abdominal drains can reduce relaparotomy indicated for haemoperitoneum and ascites. Caesarean section in the commonest abdominal surgical procedure in secondary and tertiary health facilities in Africa accounting for 1 in 3 deliveries or higher [4,5,6]. Complications such as haemoperitoneum and infection have often been the indications for relaparotomy after caesarean sections or other obstetrics and gynaecological surgical procedures [4,5,6,7,8,9,10]. The SISA drain can be used in the management of difficult obstetrics and gynaecology surgical procedures to improve outcomes by draining frank pus, purulent or bilous fluids, blood, serous and sero-sanguineous fluid, mucinous, viscous or turbid fluids from gynaecological malignancies, urine and faecal fluids from bowel perforations after pelvic and abdominal surgeries in obstetrics and gynaecology thereby minimizing relaparotomies and improving postoperative recovery. The case fatality rate for re-laparotomy after caesarean section is high and near missed fatalities are common [4].

Unlike specially fabricated types of abdominal drains such as Penrose drain, the Jackson-Pratt drain and the silastic Blake drain, the SISA Drain uses a simple and cheap existing medical device- the sterile urine drainage bag which is available in any health facility that performs abdominal surgeries in developing countries. The SISA drain is useful for monitoring intraabdominal bleeding for early interventions such as relaparotomy if it becomes necessary, transfusion or referral to higher level facilities if indicated. It is helpful in preventing some relaparotomies if it not draining actively as it gives the surgeon confidence and reassurance in the post-operative period. As in the other types of abdominal drains, post-operative recovery is improved by reducing risk of deep surgical site infection such as abscess, pelvic haematoma formation, collection of urine, lymphatic fluid and contents of hollow visceral organ due to unrecognized perforations and promote good wound healing. Difficulties in making separate incision for an abdominal drain due to anterior abdominal wall oedema and tick fat apron of the anterior abdominal wall are avoided with the SISA drain technique. SISA drain is cosmetic and does not leave a separate scar on the anterior abdominal wall and functions better due to its exit from the abdomen in the supra pubic area through same surgical incision. An abdominal drain may provide a guide on extent and continuation or otherwise of post-operative anticoagulation and antifibrinolytic therapy. Some problems with other techniques of draining the lower abdomen and pelvis includes possible complications such as puncture of inferior epigastric vessels resulting in haemorrhage from the drain site, blockage, kinking and poor functioning of the drain tube when patient is sleeping, infection of the drain site, ectopic separate scar on the abdomen due to its lateral position are avoided with SISA drain.

Abdominal packing is an option to control life threatening postpartum hemorrhage following peripartum hysterectomy. The abdomen is closed under tension to maintain pressure on the packs which are removed later at relaparotomy [11]. The option of packing the abdomen has some disadvantages including inadequate packing, improper packing technique and dislodgement of the packs. It is not possible to monitor if bleeding is continuing in good time. Packing can result in compartment syndrome and bowel function may also be affected if removal is delayed beyond the first day. The relaparotomy for removal of the packs is usually done within 24 to 72hrs which increases morbidity possibly leading to mortality since the patient who was severely ill may not have recovered satisfactory enough for the relaparotomy [4,5,6]. At relaparotomy to remove the abdominal packs, the surgeon may sometimes see the need to put in an abdominal drain if hemostasis is still not perfect and there is concern of deep surgical site infection and sepsis. The patient may require a ventilator at the ICU, require additional blood transfusion, following relaporotomy if not recovering from general anaesthesia for removal of the packs. Deep vein thrombosis due to longer immobilization, longer hospital stays due to increased morbidity, peritonitis and possibility intraabdominal abscesses and septicaemia, wound infection with delayed wound healing and cost associated with abdominal packing.

The need to drain has always been a controversial subject in surgery. There are those who believe that all intraperitoneal operations should be drained, those who feel that all drainage is useless, and those who sit on the fence and insert a drain as a safety valve or perhaps as a sop to their consciences [12]. A randomized controlled study for early stage gynaecologic malignancies concluded routinely placing pelvic drains confers no advantage [13]. Due to different levels of surgical experience and competences, some very confident surgeons may be very competent by the scope of surgical operations that they routinely perform. Some of such surgeons may consider use of abdominal drains unnecessary and the discussion of this topic may therefore be considered irrelevant. Very good surgical skills minimize post-operative complications. However, there exist different practice experience and exposure but not all surgeons have the same surgical experience in performance of surgical operations at different times of their surgical practice. Occasionally, in the hands of a confident and competent surgeon, there is a need for an abdominal drain to rescue the situation during difficult and complex operations such as those mentioned in this article. The consideration of using the SISA drain in such situations in low resource settings would be appropriate.

CONCLUSION

In low resource setting, understanding and ability to adapt to use some simple application of a cheap device like the SISA drain can contribute to reduction in morbidity and may prevent some mortalities whiles saving precious and scarce resources.

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