Name

Professor

Course

Date

Jackson-Pratt Drain

Drain in surgery is placed during operation proper as a post-operative management of the operated area of the body. The drain is only removed after the surgery proved to be a success, some days of even weeks later, depending on the complexity of the surgical procedure. The drain is connected to a small external plastic container that collects fluid or air from the operated area. The drains are not always required and should be used only if the surgeon in charge believes it is necessary. There are various medical drains, with the major being Jackson-Pratt, Chest tube, Davol, Negative pressure wound therapy, Penrose and Blake drains among others. Commonly abbreviated as JP Drain, Jackson-Pratt Drain is a medical device that uses a closed-suction technique and the equipment to drain the patient after operation of fluids and residue from surgical sites (Macedo et al., 68). The instrument is made up of a drain placed internally with a tube connecting it to an external bulb round in shape via a plastic container. There are some surgeries which call for the use of JP Drain after the operation. Discussed below are the most common 29 surgeries where an individual may require JP Drain to remove fluids and air from the operated site.

- **Cervical Tracheal Resection and Reconstruction:** the procedure applies just after anastomosis immediately when the wound is closing. During the period, a polypropylene Jackson-Pratt is placed right between the sub-mental skin and just above the skin angle of Louis. It is essential to carry out skin stitch at this time to prevent sudden hyperextending. Due to its rare occurrence, data on this condition is limited, but according to Bassi et al. (210), averagely 20000 people rely on Jackson-

Pratt drain to drain fluids and leaks from the operated areas of the body. Majority of the patients that are dependent on the pipe do so to speed the recuperation process.

- **Postoperative Care of Pediatric Transplant Recipient:** among patients with organ transplant, it is standard, mostly for children, to experience technical variant grafts resulting from the size mismatch. The Jackson-Pratt drain functions well when there is an overall mismatch in draining fluids. As is common in renal dysfunction, after surgery the condition will result in water and salt retention after LT. Patients with a liver transplant in some cases suffer from hepatic congestion as a result of hyperperfusion which would most likely result in the formation of ascites. After the transplantation of the organ, if there is a relative mismatch between the the recipient and donor organ vascular size, it would result in formation of ascites. The outcome of formation, say Chylous Ascites disrupts lymphatic function caused by perforation or obstruction. Even though the management of ascites depends on the cause, the Jackson-Pratt Drain is widely used after the surgery. The concept is based on the general approach which is to limit the fluid intake and replace protein losses. The total number of organ transplant in the USA exceeds thirty thousand annually (Dinsmore, Harris & Robert 982). In most cases, the process is successful while sometimes complications like mismatch lead to the formation of ascites which calls for the use of drains. Average number of patients using JP drain yearly is no more than a quarter of the total patients operated on, i. e. roughly between 10,000 and 15,000 patients.
- **Adjustable Breast Implants:** In this case, Jackson-Pratt drain is commonly applied when fine-tuning the volume of the implant. Also important when adding the required amount of saline to the transplant. The procedure is done through exterior or buried injection. This type of surgery over the years gained fame. It is estimated that the figures are on the rise and it is the highly performed cosmetic surgery. In 2013 alone,

close to 300,000 operations were carried out in the USA. The average number is between 200,000 and 300,000 annually. Which translates to over half of the number relying on JP drain as a post-surgery management.

- **Robotic Renal Surgery:** to control pain after an operation, surgeons prefer the use of morphine sulfate and intravenous Ketorolac. To remove the Foley catheter, doctors prefer the method of Jackson-Pratt drain in cases of low output. Removal of the Foley catheter depends on the amount of fluid in JP drain. In most cases, the doctors remove it after JP drain reaches less than 50mL after every eight hours. When the fact is opposite, the surgeons will most likely replace the catheter and discharge the patient with it and JP drainage. The surgery has become popular in the country over the years (Nigar 246). Last year alone, the number of people operated using the process was 400,000, but the number is expected to triple in the next three or four years. Some injuries may occur during robotic renal surgery even though in rare circumstances. In cases of tissues injury, surgeons recommend JP drain as the best drainage alternative. From the figure, the number of pipes was not more than 50,000 that year.
- **Organ Transplantation:** after liver transplant and successful operation on a patient, they do emerge from the procedure with a number of JP drain and some tubes. Jackson-Pratt drain should be on the surface of the liver to perform the function of draining fluid tinged with blood. After some time, the drainage decreases and the tubes are removed gradually, but it is advisable to leave one in place for a week or so after surgery, just as a precaution. A JP drain tube must be left on the bile duct after surgery as a way of monitoring the consistency of bile regarding amount and color. After the operation, the tube should remain in place for up to twelve weeks. After a liver transplant, patients always experience injury to the kidney most of which are acute. There are several reasons behind the injuries, the most common ones being the

intraoperative hypotension, preoperative renal function and toxicity from medication. Complications associated with liver transplant include stricture or commonly known as a biliary leak and hepatic artery thrombosis. Literature suggests that JB drainage is one way of monitoring the progress in healing. The general number of organ transplantation taking place in the United States stands at 30,000 yearly. In some years the figure may go up depending on the patient, for example in 2015 the number of operations exceeded the 30,000 figures. In rare cases after operation management involves draining to avoid infections and any side effects. Jackson-Pratt drain accounts for up to 5,000 incidences of managing the case.

- **Primary graft failure:** familiar immediately after the operation and can be visible. The characteristic of the condition manifests in an abnormal liver function. Surgeons recommend JP drain as a way of removing fluids that may be the primary cause of the failure. The failure is common after lung and heart transplantation. There are a few recorded cases of JP drain use for managing the failure. The number was lower than a thousand in 2015 with no data for the following years.
- **Acute Pancreatitis:** management of pancreatic fistula commonly consists of the output of pancreatic juice through percutaneous drainage. It is easy to diagnose external fistula as it entails an assessment of drained peripancreatic fluid. However, it should be notde that the drain from JP after pancreatic resection peripancreatic operation is not a proof of an external leak. Even though used a lot previously, some scholars have highlighted the shortcomings of the use of JP drain in pancreatic surgery. Some of the concerns raised include slowing down the recovery process, increase hospital stay and finally may cause complications after an operation like retrograde intra-abdominal infections among others. Acute pancreatic is a common complication, but with the medical innovations, the numbers of surgeries have

significantly lowered over the years. As a management practice for patients after surgery, Jackson-Pratt drain is primarily used. In 2017, according to Healthy People 2020, close to 10,000 patients used the device even if it was for a short period.

- **Esophageal Perforation:** the condition is life-threatening with high incidences of mortality. The management of the disease is always very challenging to the surgeons. One of the very easy and proven ways of managing condition is through JP drain as the process avoids any complications that might arise as a result of esophagectomy from both the primary and secondary reconstruction (Aykan et al., 68). In this case, the initial steps include the lung retraction followed by the removal of purulent exudates and fibrous debris. A preferred way of doing so is through the use of Jackson-Pratt drain together with between 28 and 32 French chest tube to do away with mediastinum. Since JP drain is the commonly used management mechanism, most of the patients who have undergone surgery would use this method. In the nation, a total of 20,000 patient's wounds were managed by this kind of drain system.
- **Abdominal Surgery:** there are various types of drains used after abdominal surgery. Jackson-Pratt is one of such examples. The concern among medical practitioners is the question whether JP drain is a valid measure in managing post abdominal surgery. Abdominal surgery management through Jackson-Pratt drain allows for healing of the wound, reduction of pain and collection of fluid which would cause infections if not drained. Patients may be discharged with the JP drain but under some conditions like regular checks for any sign of infection. The use of drains as a management mechanism after the abdominal operation is still widespread in the country. According to available data by the Center for Disease Control, the figure stands at a maximum of 38,000 which is almost half of the total number of patients undergoing abdominal

surgery. 2016 registered the lowest number of patients depending on JP drain at 25,000 after abdominal surgery, but the number went up afterward.

- **Craniotomy:** this is a standard procedure in the nation characterized by post-operative pain. The National Center for Health Statistics states that depending on the sickness, the estimated number of craniotomy in the United States were as follows, tumor at 70,800, followed by the vascular surgery at 2000 and for the rest at 56,000. JB drain is used as a mechanism for controlling prolonged pain. The number of incidences where surgeons recommended JP drain was slightly less than the total annual reported cases. The drainage works best when the patient is still under monitoring by the responsible practitioner.
- **Buttock Augmentation:** is a procedure among women that involves plastic reconstructive surgery. Buttock augmentation consists of the following: enlargement, reconstruction or reduction of the butt. This kind of operational process carries with it some risks that include infection and fluid accumulation. As a precaution for avoiding fluid accumulation, most surgeons use Jackson-Pratt drain. It is a widely accepted procedure when it comes to buttock augmentation (Hughes et al., 412). In the United State, the incidences of buttock augmentation surgery have been on the rise, so does the use of JP drain as far as the procedure is related. In 2015, up to 300,000 women underwent the procedure, half of the figure used JP drain to remove fluids after successful surgery.
- **Cardiothoracic Surgery:** as a treatment that involves handling organs inside the thorax, successful operation, in this case, calls for postoperative care. One way of post-surgical care is through draining using Jackson-Pratt or any other available methods. The organs involved in this cardiothoracic surgery include the great vessels and the heart. An assessment of the past number of this kind of operation indicates

increasing figures. For example, in 2007 the amount stood at an average of 270,000, but this dropped in 2014 to 260,000, and The National Center for Health Statistics has made a projection of 350,000. Also important to note is that the JP draining from such operations corresponds with the number of surgeries carried out per annum.

- **Heart Surgeries:** thousands of this kind of surgeries takes place daily in the country. In a recent statistics released, it is estimated that surgeons performed over half a million coronary bypass surgeries. The number of people undergoing heart transplant per year is 3,200 patients. Just like other standard surgeries, heart operation calls for post-surgery management and the commonly applied technique is the use of Jackson-Pratt drain. Of the total heart surgeries, close to three quarters, according to Center for Disease Control are put on JP drain as a way of removing the fluids from the operated area. The procedure may be risky, but it works in lowering the pain and risk of infection.
- **Gastrointestinal Surgeries:** Jackson-Pratt drain is applied in this case to reduce post-surgical vomiting and nausea and also to minimize the levels of abdominal distension. The drainage is applicable in cholecystectomy, hepatic resection, and upper gastrointestinal surgery. In the country, there are some gastrointestinal operations. Annually, close to 80,000 patients are operated on with the intestine associated condition. In almost every case the patients are subjected to a draining system as a means of managing post-operation. The procedure is widely widely regarded as successful.
- **Lung Surgeries:** Jackson-Pratt silicone is commonly used as postoperative management in lung surgery. The method is so widespread that it is has been studied in some literature. According to statistics availed by Thoracic Surgery Database, a considerable number of people undergo lung surgery in the United States. Between

1999 and 2006, according to the database, the country recorded 49,029 instances of lung surgery. Even though the number has reduced, it is still high according to Center for Disease control that recorded 3954 operations in 2017. As mentioned, JP drain is the preferred mechanism for removing fluid and gases in the operating region. Of all the reported cases, close to half of the patients were subjected to JP drain.

- **Breast biopsy:** involves the removal of tissues or cells for a test or complete replacement of the damaged ones. This operation consists of the use of hollow needs as a mechanism for extracting tissues. After this operation, doctors recommend the use of JB drain for a day or two to remove any fluids or gases that may form in the operated area. The country registers one of the highest incidences of breast biopsy in the world. According to the availed data by The National Center for Health Statistics, close to half a million women undergo breast biopsy annually. Of the total, depending on the severity of the condition, up to 200,000 are subjected to Jackson-Pratt drain as a management mechanism.
- **Debridement of wound:** this is a surgical procedure performed to remove any damaged body part or foreign material in the body. The removal of the dead tissues or cells will result in new growth. In almost all parts of the body, debridement of a wound involves the use of Jackson-Pratt drain after the surgery. The mechanism is one of the surest ways of removing fluid after a procedure performed to remove the dead body parts. There are no defined records of some patients operated on annually to remove foreign materials and dead parts but different studies approximate at around 200,000.
- **Cesarean section:** the procedure is applicable as an alternative to vaginal delivery. After the operation, infection or gases gather in the operated area. Jackson-Pratt is a sure way of doing away with such. It is important to note that not every C section

surgery will call for a drain. The Center for Disease Control data indicates that Cesarean section delivery stands at 1,238,581 annually which almost half of the vaginal distribution. The figure for mother subjected to JP drain is way lower. Most of the C section procedure ends up successful with no cases of infection. In any other abnormal outcome, the patients are subjected to Jackson-Pratt drain.

- **Joint replacement Surgeries:** aims at the removal of diseased or damaged parts of any body joint and finally replacing the old with a new one. Replacement reduces incidences of pain, and in most cases, patients feel better. Joint replacement surgery, just like a host of other operations calls for postoperative care. The best way to reduce incidences of pain and infection is through the use of Jackson-Pratt drain inserted on the operated areas of ankles, fingers, shoulders, and elbows. In 2017 alone, up to 860,080 joints of patients were performed on in the United States. Of the number, close to 200,000 were subjected to Jackson-Pratt drain as postoperative management.
- **Plastic Surgery:** Many but not all surgeries in this category involve the placement of Jackson-Pratt drain. The drain is placed during operation through the wound to allow fluid to go inside. According to the 2017 American Plastic Surgery Statistics, the total number of esthetic surgeries performed was 1,668,420. The figure is expected to rise as the procedure is slowly becoming popular.
- **Breast Augmentation:** the procedure requires the use of Jackson-Pratt drain if there is excessive bleeding during surgery. The pipe in most cases applies when the operation calls for an implant for breast reconstruction surgery. In the country, breast augmentation surgery is common among women aged between 19 and 50 years. Going by the 2017 statistics, up to 800,000 women in the United States underwent the procedure.

- **Mastectomy:** Jackson-Pratt is also applicable in both total and straightforward mastectomy. Jackson-Pratt drain, in this case, is necessary for removing fluids that may build up in breast area after the operation. Over the past decade, the number of mastectomy in the country has been on the rise. In 2005, there were 66 cases in 100,000 women. The figure has changed to close to 100 surgeries in 100,000 in 2015. The facts are high in women having a double mastectomy.
- **Breast reduction:** just like the other cosmetic surgeries, this one too calls for the insertion of Jackson-Pratt during the procedure to drain lymphatic fluids and blood. The drain has a tube running to a bulb reservoir from the surgical site. According to the available data by American Society of Aesthetic Plastic Surgery, approximately 150,000 women undergo breast reduction surgery per year, and the number is expected to rise by the year 2020.
- **Thoracic Surgery:** Jackson-Pratt drain is applicable during the general thoracic surgery for the best drainage of fluids and air. JP drain is used during this procedure as it does not make the patient uncomfortable neither does it cause pain. Some of the thoracic surgeries that incorporate Jackson-Pratt drain are lung or pleural operations. The drain stays in the operated area after the procedure. According to the available data from two of the most prominent thoracic surgery association, American Association of Thoracic Surgery and The Society of Thoracic Surgeons, there are 5,270 surgeons in the country undertaking close to 278,000 operations annually.
- **Orthopaedic Test:** loosely, Jackson-Pratt drain applies after an orthopedic surgery as a way of removing fluids, in this case, blood from a wound resulting from the operation. JP drain applies in this instance as a way of minimizing the occurrence of injury hematomas and other infections. Incidences of orthopaedic surgeries are frequent in the United States with approximately 26,000 surgeons throughout the

country. The American Academy of Orthopaedic Surgeons estimates that annually, the nation registers close to 600,000 cases of this kind of operation. Of the total number, almost a quarter of the figure use JP drain as the primary means of removing fluid and blood.

- **Pancreatic Surgery:** after pancreatic surgery, most surgeons consider the use of drain as a mandatory procedure as post-operation management. Jackson-Pratt drain is commonly inserted during the operation as postoperative management in removing unwanted fluids and air. The process is standard in the country with an annual approximation of 55,444 adults being operated on in various hospitals. Of the figure, there are more males than females and more than three-quarters of the number used JP drain to manage the operation.
- **Biliary surgery:** as an operation on the common bile duct connecting the gastrointestinal tract and the liver, surgeons recommend the insertion of the drain during operation as a way of removing fluids and air that may form in the operated area. Jackson-Pratt drain is not commonly used after this surgery, but some surgeons recommend it as it comes with some advantages. There are no precise records kept for the number of operations of biliary surgeries in the country, but according to estimation by the National Inpatient Sample, annual figures stand at something between 9,000 and 10,000. Of the numbers, not more than an eight cases register the use of Jackson-Pratt drain meaning that this procedure may not be commonly applicable in this case.
- **Thyroid Surgery:** generally, surgeons advice that all operated thyroid patients should have a drain placed during the procedure as a way of after-surgery management of hematoma. Other surgeons on the other hand dispute the contribution of pipes in reducing chances of hematoma though they are still mostly in use. JP drain is one

typical example placed during thyroid surgery. In the United States, the number of thyroid surgeries, according to the availed figures by National Trends in Thyroid Surgeries is fewer than 70 procedures annually.

- **Trauma Surgeries:** one of the surgeries that utilize JP drain is trauma surgery. The procedure involves placing a soft rubber tube on the operated area. It assists in wound healing as it promotes tissue granulation. The available data indicate that the country registers a high number of trauma surgeries of more than one million people annually. Majority of the injuries come from accidents.
- **Neurosurgery:** Jackson-Pratt drain is applicable in this surgery as a way of managing intracranial pressure resulting from obstruction of the normal flow of cerebrospinal fluid in the human brain. The aim of the drain at this point is to divert fluid flowing from the ventricle of the brain which will then allow for ease monitoring of intracranial pressure. In the country, there are, on average, 1,000 neurosurgeries performed every year, according to the National Center for Health Statistics.
- **Infected Cyst:** Jackson-Pratt in this instance is used to remove pus from any infected area after an operation. A surgeon inserts the tube during operation as a way of managing the wound after surgery. The cyst may develop in any part of the body after surgery, so doctors take precaution.

In conclusion, post-surgery management is an essential process in the general wellbeing of any patient. Some drains can be used to remove unwanted fluid after the operation, but the commonly used ones include Jackson-Pratt. From the list above, it is a common mechanism in the United States.

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