

# For Paraventricular Brain Metastases, Endoscopic Port Surgery using a Low-Cost Device

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**Received Date :** Sep 22, 2023

**Accepted Date :** Sep 24, 2023

**Published Date :** Oct 21, 2023

## Abstract

**Objective :** Throughout last years variety of cannular surgical instrument systems were delineate for endoscopically removal of chamber and periventricular brain tumors. However, these ways square measure too high-priced for underdevelopment countries. in an exceedingly antecedently report a cheap and easy cylindrical channel surgical instrument was delineate. we have a tendency to describe the results of this various technique with some technical variations in an exceedingly cohort of patients with deep brain metastases and discuss the technical aspects.

**Methods :** Elaborate description of the scrutiny Port Surgery victimization an alternate technique with illustrative cases.

**Results :** A complete of six patients underwent surgical surgery of Associate in Nursing intraaxial periventricular brain metastases. there have been four ladies and a couple of men with a mean age of sixty four,2 years (range, 58-72 years). Clinical presentation was: headache (n=2), seizures (n=2) and hemiparesis (n=2). Lesion location was as follows: frontoparietal (n=4), frontal (n=1) and membrane bone (n=1). Primary website was as

follows: breast (n=3), respiratory organ (n=2) and thyroid (n=1). the common six was a pair of,9 cm (range, 2,5-3,5 cm). There was gross total surgery altogether patients. 2 patients suffer transient hemiparesis without different complications. Surgical time average was a hundred thirty five,7 minutes (range, 90-190 minutes). The mean blood loss was 116 metric capacity unit (range, 50- 240ml). The mean hospital keep was six,2 days (range, 5-9 days). The mean following was six,8 months (range, 4-12 months).

**Conclusion :** In befittingly hand-picked patients with brain metastases, scrutiny Port Surgery offers a viable choice to succeed the goals of neoplasm surgery with low morbidity and quick recovery. The changed 20-ml syringe may be used as a clear cannular surgical instrument and it's straightforward, light-weight, cheap and effective. together with stereotactic system and examination may be a decent various in centers of underdevelopment countries and restricted resources.

**Keywords:** Cylindrical retractor; Endoscopy; Periventricular tumors; Brain metastases; Tumor; Finger glove; Stereotactic; Bone flap; Fashion; Brain spatulas; Manipulation; Stereotactic cannula; Homogeneous; superimposed brain; tube-shaped structure damage; Complications; Dynamic; Magnification; os bone; Bipolar; Meticulous

## Introduction

Intraventricular and periventricular tumors have conventionally been resected through transcortical routes, routinely requiring the utilization of brain retractors that consist in varied varieties of spatulas to stay the surgical passageway and ensured the microsurgical surgery. withal, this system doesn't apply equally distributed pressure and complications as tube-shaped structure injury, brain swelling, seizures and focal medicine deficits aren't uncommon [1-4].

To solve this drawback variety of cannular retraction systems are developed with equally distributed pressure that square measure combined with Associate in Nursing scrutiny visual image technique

to confirm higher surgical field illumination and angular vision [5-14]. However, these ways square measure too high-priced for underdevelopment countries. in an exceedingly antecedently report Sinhg & Agrawal [15] delineate a cheap and easy cylindrical channel surgical instrument. we have a tendency to describe the results of this various technique with some technical variations in six patients with deep brain metastases and discuss the technical aspects.

## Methods

The procedure enclosed anesthesia, lineal incision and 3cm diameter surgical operation supported frame stereotactic guide (Estereoflex system) followed by cruciate meninges gap (Figure one A &B). Transcortical approach was performed by means that transgyral means (2cm corticectomy) in line with the stereotactic planned route. employing a finger glove mounted on stereotactic tube as balloon device, the tube tip was advanced to the pre-calculating external lesion purpose. Them, a dilatation of corticectomy and white neural structure fibers was performed with inflation of balloon victimization traditional saline till it had been born-again into spherical gap. The channel surgical instrument was advanced step by step by means that repetitive insufflation and partial economic process of the balloon that place the brain away (Figure one B &C).

All lesions were resected beneath full scrutiny visual image employing a 0° and 30°, 4mm, 18cm rigid scope (Karl stortz, Germany) and stereotactic guide. The second operating surgeon | sawbones | doctor | doc | physician | MD | Dr. | medico } hold the scope at twelve o' clock position whereas the primary surgeon performed a typical microsurgical surgery with the suction tube and bipolar or dissection instruments round the seventh and fifth hours severally. we have a tendency to don't use any scope holder as a result of we have a tendency to like a dynamic magnification like endonasal scrutiny approach. All lesions were resected in an exceedingly "in block" fashion due their tiny size (Figure one E & F & Figure a pair of A & E).

Finally, a meticulous stop of surgical field was performed, then the cavity was irrigated with heat saline and therefore the surgical instrument was rigorously retired distinguishing and cauterizing any harm of the surgical passageway (Figure one F). The plant tissue entry website was lined with Surgicel, and therefore the dura mater was then closed watertight fashion. The bone flap was replaced, and therefore the wound was closed customary fashion. Patients were extubated within the operation area and keep within the medical aid Unit long.

A twenty four hours CT scan was performed to detected any complications (Figure a pair of D & E). Sutures were removed at post-operative day seven.

## Results

A total of six patients underwent surgical surgery of Associate in Nursing intraaxial periventricular brain metastases. there have been four ladies and a couple of men with a mean age of sixty four,2 years (range, 58- seventy two years). Lesion location was as follows: frontoparietal (n=4), frontal (n=1) and membrane bone (n=1). Primary website was as follows: breast (n=3), respiratory organ (n=2) and thyroid (n=1). the common size was a pair of,9 cm (range, 2,5-3,5cm).

Duration of surgery ranged from ninety to at least one hundred ninety minutes, with a mean 100 thirty 5,7 minutes. The mean blood loss was 116 metric cubic content unit with a selection from fifty to 240 metric cubic content unit. The mean hospital keep was six,2 days with a selection from 5 to 9 days. The mean following was six,8 months with a selection between four and twelve months.ht dispersion. later on, several teams have printed their expertise [5-14]. various potential benefits has been rumored was as follow:

- a. Minimizes the scalp incision related to little surgical process size
- b. Decreasing nerve tissue disruption because the tip style minimizes the danger of fascicles injury throughout cannulation;
- c. Allowing homogeneous radial dispersion of the pressure on the encompassing tissue;
- d. Guaranteeing stability because the rigidity prevents unintended enlargement of the initial diameter of the corticectomy and white fiber tract dissection throughout surgery;
- e. Shielding the encompassing tissues against induced injuries caused by instrument entry and reentry;
- f. Affording constant mental image of the tissue traversed given the clear passage design;
- g. Offering a large angle of read and a wonderful magnification.

We don't found major complications with this technique. In fact, solely 2 patients with brain metastases next to motor silver-tongued areas suffer transient hemiparesis, probably associated with post operatory puffiness. The surgical time and blood loss were bottom. However, this technique remained restricted in their ability to handle larger and additional tube

tumors, as they lacked the flexibility of the binocular microscope likewise as its ability to supply multiple angles of tumoral mental image and instruments manipulation. we tend to ascertained that hemostasia was obtained in somewhat tougher fashion, however this reality is stipendiary with the decreased meninges gap and nerve tissue manipulation.

The goals of scrutiny Port Surgery ar associated with the goals of typical microsurgical growth operation: peak growth resection with useful neurological conservation. Tumors with a major superjacent cuff of traditional brain parenchyma (> 1cm), soft consistency (thus favored piecemeal removal), and low or moderate property ar the best candidates for scrutiny Port Surgery like primary brain tumors, metastases and cavernous malformations. urinary organ cell malignant neoplastic disease metastases ar the sole exception due their high tube element. just in case of most brain metastases the firm consistency will facilitate to circumferentially spiral dissection and "in toto" operation, that is right in these circumstances. yet, it's necessary to require account that if a operation "in toto" may be a goal, the lesion most diameter can't extent over the diameter of the cylindrical surgical instrument. That's why we tend to believe that tiny brain metastases ar the best candidates for scrutiny Port Surgery. On the opposite hand, lesions a lot of larger than the port itself is take away adjusting the port angles to 360° rotation throughout the operation so as to facilitate dynamic lesion mental image. Otherwise, if the long axis of the growth is perpendicular to the bone, the port is advantageous by limiting the quantity of nerve tissue dissection needed for growth removal.

Commercials and alternatives systems

There ar 3 main technologic parts of any scrutiny Port Surgery:

- a. associate degree image steering (such as neuronavigation, ultrasound or frame stereotactic system)
- b. A cylindrical brain surgical instrument (commercials or alternatives)
- c. A magnification technique (usually the endoscopy)

Kassam, et al. [19] rumored the employment of cylindrical surgical instrument comparatively equally to the way of Dr. Kelly's pioneering work however with a smaller port size (11.5mm), utterly scrutiny mental image and therefore the use of frameless image-guidance. Some alternatives systems are delineate. Kutlay, et al. [20] delineate a commercially obtainable clear plastic medical specialty associate degreeoscope with an inner diameter of eighteen millimeter and a length of 54mm (Sapimed, S.p.A. Alessandria, Italy). Singh & Agrawal [15] rumored the employment of easy technique of employing a

cylindrical channel surgical instrument custom created out of 20cc plastic syringe and a finger glove mounted on brain canula as a balloon device. Corticectomy was performed with the assistance of ultrasound steering. it's clear so early detection of intumescence to the encompassing brain is feasible. we tend to were victimization this technique with some technical variations. First, our image steering was a frame stereotactic system, with the balloon device connected to the stereotactic tube. Second, we tend to advanced the canula with the deinflated balloon connected till the tip was arrived to the external growth surface and then the canula was bit by bit expanded and deinflated whereas the cylindrical channel surgical instrument was advanced. With this easy, light-weight, clear, freely movable and cheap technique, effective operation of lesions may well be achieved, and therefore the surgical goals of surgery were seen altogether our patients.

## Conclusion

In fittingly hand-picked patients with brain metastases, scrutiny Port Surgery offers a viable choice to bring home the bacon the goals of growth surgery with low morbidity and quick recovery. The changed 20-ml syringe is used as a clear cannular surgical instrument and it's straightforward, light-weight, cheap and effective. together with stereotaxic system and examination is a decent different in centers of underdevelopment countries and restricted resources.

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