



## FOLIA MEDICA INDONESIA

UNIVERSITAS AIRLANGGA

P-ISSN : 23558393 <> E-ISSN : 2599056X Subject Area : Education



0.466667

Impact Factor



1081

Google Citations



Sinta 2

Current Accreditation

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2022

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#### The AKT Pathway and Satellite Cell Activation in Skeletal Muscle Mass Regulation

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[Folia Medica Indonesiana Vol. 58 No. 1 \(2022\): March 68-73](#)

2022

[DOI: 10.20473/fmi.v58i1.13354](#)

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2022

[DOI: 10.20473/fmi.v58i1.18247](#)

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#### Back Matter Vol.58 No.1 March 2022

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[Folia Medica Indonesiana Vol. 58 No. 1 \(2022\): March](#)

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2022

[DOI: 10.20473/fmi.v58i1.31423](#)

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[Folia Medica Indonesiana Vol. 58 No. 1 \(2022\): March 1-9](#)

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### [Front Matter Vol.58 No.1 March 2022](#)

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[Folia Medica Indonesiana Vol. 58 No. 1 \(2022\): March](#)

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[Folia Medica Indonesiana Vol. 58 No. 1 \(2022\): March 50-55](#)

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# FOLIA MEDICA INDONESIANA

Vol. 55 No. 4 December 2019

**EFFECT OF IN-VITRO ALPHA LIPOIC ACID ADDITION ON SPERMATOZOA MOTILITY IN SPERM PREPARATION PROCESS**

(Gede Wira Buanayuda, Hamdani Lunardi, Indra Gusli Mansur)

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(Aif Rusdawan, Taufikurachman)

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(Bernadette Dian Novita, Silvia Sutandhio)

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(Nurvaesis, Diana Yulizawati, Evelyn Komaratih, Heriyawati)

**THE EXPRESSION OF E6 HPV, p53 AND p16INK4A AT WELL, MODERATELY, AND POORLY DIFFERENTIATED CERVICAL ADENOCARCINOMA**

(Gondo Maslulik, Alphaia Rahniayu, Nila Kurniasari, Anny Setijo Rahaju, Rahmi Alia, Sjahjenny Mustokowari)

**CORRELATION OF MOTHERS WITH HISTORY OF DIABETES MELLITUS AND INFANTS WITH ANTI-GAD65**

(Nanda Fachilah Witriz Salamy, Gadis Meinar Sari, Bambang Purwanto, Sulislawati)

**EFFECTIVITY OF ERYTHROPOIETIN-ALPHA BETWEEN FIXED- AND ADJUSTED-DOSE IN CHRONIC KIDNEY DISEASE PATIENTS WITH ANEMIA ON HEMODIALYSIS**

(Mida Purwiningtyas, Yulistiani, Budi Suprapti, Bayu Dharma Santi)

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Folia Medica  
Indonesiana

Vol. 55

No. 4

Page 246-325

Surabaya  
December 2019

p-ISSN: 2355-8393  
e-ISSN: 2599-056X

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<b>Folia Medica Indonesiana</b>	<b>Vol. 55</b>	<b>No. 4</b>	<b>Page 246-325</b>	<b>Surabaya December 2019</b>	<b>p-ISSN: 2355-8393 e-ISSN: 2599-056X</b>
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# **FOLIA MEDICA INDONESIA**

**p-ISSN 2355-8393, e-ISSN 2599-056X**

**Vol. 55 no. 4 December 2019**

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**Medical journal, published by Airlangga University School of Medicine, Surabaya, publishing original basic medical and clinical articles presented as research articles and review articles**

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Published by : **GRAMIK (Graha Masyarakat Ilmiah Kedokteran)**  
(Center for Medical Science Community)  
Quarterly (March, June, September, and December)

Address : **Airlangga University School of Medicine**  
Jl. Prof dr Moestopo 47 Surabaya 60131  
Phone: 62-31-5013749, 5020251-3 ext. 135  
Fax : 62-31-5013749, 62-31-5022472  
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**Accredited no. 2/E/KPT/2015**

# FOLIA MEDICA INDONESIA

p-ISSN 2355-8393, e-ISSN 2599-056X

Vol. 55 no. 4 December 2019

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## CONTENTS

<b>EFFECT OF IN-VITRO ALPHA LIPOIC ACID ADDITION ON SPERMATOZOA MOTILITY IN SPERM PREPARATION PROCESS</b> (Gede Wira Buanayuda, Hamdani Lunardhi, Indra Gusti Mansur)	246 – 250
<b>THE CORRELATION BETWEEN <i>icaA</i> AND <i>icaD</i> GENES WITH BIOFILM FORMATION <i>Staphylococcus epidermidis</i> IN VITRO</b> (Dian Rachmawati, Kuntaman, Lindawati Alimsardjono)	251 – 259
<b>CORRELATION OF POPULATION AND ENVIRONMENTAL BEHAVIOR WITH RAT DENSITY RATE IN PLAGUE DISEASE-FOCUS, THREATENED AND SAFE AREAS IN TUTUR DISTRICT, PASURUAN REGENCY, 2016</b> (Evi Noerista Lestari, Susilowati Andajani, Usman Hadi)	260 – 267
<b>ANALYSIS OF IFN-<math>\gamma</math> AND IL-10 LEVELS AS MARKERS OF INFLAMMATION AND RESPONSE THERAPY OF ANTI-TUBERCULOSIS IN MDR LUNG TB PATIENTS</b> (Herni Setyawati, Soedarsono, Yulistiani, Umi Fatmawati)	268 – 274
<b>EFFECT OF GLUTAMINE SUPPLEMENT ADMINISTRATION ON THE REDUCTION OF MUSCULAR FATIGUE POST-ECCENTRIC EXERCISE</b> (Afif Rusdiawan, Taufikkurrachman)	275 – 279
<b>COMPARISON OF ANTROPOMETRY AND PHYSICAL ABILITIES BETWEEN TRAINED AND UNTRAINED INDIVIDUALS IN SECOND GROWTH PHASE</b> (Idzam Kholid Akbar, Bambang Purwanto, Hari Setijono)	280 – 284
<b>THE EFFECT OF <i>Cinnamomum burmannii</i> WATER EXTRACTION AGAINST <i>Staphylococcus aureus</i>, <i>Enterobacter spp.</i>, <i>Pseudomonas aeruginosa</i>, AND <i>Candida albicans</i>: IN VITRO STUDY</b> (Bernadette Dian Novita, Silvia Sutandhio)	285 – 289
<b>THE EFFECT OF SUBCONJUNCTIVAL BEVACIZUMAB ON ANGIOGENESIS IN RABBIT MODEL</b> (Nurwasias, Diana Yuliawati, Evelyn Komaratih, Heriyawati)	290 – 294
<b>THE EXPRESSION OF E6 HPV, p53 AND p16INK4A AT WELL, MODERATELY, AND POORLY DIFFERENTIATED CERVICAL ADENOCARCINOMA</b> (Gondo Mastutik, Alphania Rahniayu, Nila Kurniasari, Anny Setijo Rahaju, Rahmi Alia, Sjahjenny Mustokoweni)	295 – 300
<b>CORRELATION OF MOTHERS WITH HISTORY OF DIABETES MELLITUS AND INFANTS WITH ANTI-GAD65</b> (Nanda Fadhillah Witris Salamy, Gadis Meinar Sari, Bambang Purwanto, Sulistiawati)	301 – 305
<b>EFFECTIVITY OF ERYTHROPOIETIN-ALPHA BETWEEN FIXED- AND ADJUSTED-DOSE IN CHRONIC KIDNEY DISEASE PATIENTS WITH ANEMIA ON HEMODIALYSIS</b> (Mida Purwiningtyas, Yulistiani, Budi Suprapti, Bayu Dharma Santi)	306 – 310
<b>Case Report:</b> <b>THE ROLE OF INTRAVASCULAR ULTRASONOGRAPHY IN PATIENTS UNDERWENT PERCUTANEOUS CORONARY INTERVENTION</b> (Yudi Her Oktaviono, Alisia Yuana Putri)	311 – 321
<b>Case Report:</b> <b>VENTRICULOPERITONEAL SHUNT CATHETER MIGRATION AND TRANSANAL EXTRUSION IN PERSISTENT VEGETATIVE STATE ADULT PATIENT</b> (Asra Al Fauzi, Muhammad Arifin Parenrengi, Joni Wahyuhadi, Eko Agus Subagio, Agus Turchan)	322 – 325



**Case Report:****VENTRICULOPERITONEAL SHUNT CATHETER MIGRATION AND TRANSANAL EXTRUSION IN PERSISTENT VEGETATIVE STATE ADULT PATIENT****Asra Al Fauzi, Muhammad Arifin Parenrengi, Joni Wahyuhadi, Eko Agus Subagio, Agus Turchan**

Department of Neurosurgery, Faculty of Medicine, Universitas Airlangga, Surabaya Neuroscience Institute, Dr. Soetomo Academic Medical Center Hospital, Surabaya, Indonesia

**ABSTRACT**

*The complications of ventriculoperitoneal (VP) shunts are many and are reported in literature extensively. The complication of transanal extrusion after bowel perforation is known although rare. This complication is very well described amongst the children. The authors describe the case of bowel perforation and transanal extrusion of a VP shunt occurring in a 51-year-old adult patient. The patient has a history of craniotomy for acute subdural hematoma after severe head injury one year ago continued with VP shunt for post-traumatic hydrocephalus. Home care with bedridden conditions is done at home until finally, the family gets the catheter extrude from the transanal. Bowel perforation and transanal extrusion of VP shunt catheter is a rare but serious problem. The exact pathogenesis of shunt-related organ perforation and extrusion through the anus is unclear, and various mechanisms have been suggested, Among many factors, age is the prominent factor for bowel perforation. Because of weak bowel musculature and stronger peristaltic activity, children are more susceptible to bowel perforation than adult patients. In adult shunted patient, one of the risk factors is related to PVS with chronic immobilization, as described in this case. Risk factors of bowel perforation in adult are quite distinct from children. Persistent vegetative state (PVS) with chronic immobilization is one of the risk factors to be aware of.*

**Keywords:** *Ventriculoperitoneal shunt; transanal extrusion; persistent vegetative state; adult patient*

**ABSTRAK**

*Komplikasi ventriculoperitoneal (VP) shunt sudah banyak terjadi dan dilaporkan dalam berbagai literatur secara luas. Komplikasi ekstrusi transanal setelah perforasi usus juga telah diketahui meskipun angka kejadiannya masih jarang. Komplikasi ini telah jamak dijelaskan dan diketahui sering terjadi pada anak-anak. Para penulis melaporkan sebuah kasus perforasi usus dan ekstrusi transanal dari VP shunt yang terjadi pada seorang pasien dewasa berusia 51 tahun. Pasien tersebut memiliki riwayat kraniotomi untuk hematoma subdural akut setelah cedera kepala parah satu tahun yang lalu, dilanjutkan dengan VP shunt untuk hidrosefalus pasca trauma. Perawatan dengan kondisi bed ridden dilakukan di rumah, sampai akhirnya keluarga mendapati adanya kateter yang keluar dari lubang anus. Perforasi usus dan ekstrusi transanal dari VP shunt catheter adalah masalah yang cukup jarang namun perlu perhatian serius. Patogenesis pasti dari perforasi organ yang berhubungan dengan shunt dan ekstrusi melalui anus tidaklah jelas, dan berbagai mekanisme telah disarankan, di antara banyak faktor, usia adalah faktor utama untuk perforasi usus. Karena otot-otot usus yang lemah dan aktivitas peristaltik yang lebih kuat, anak-anak lebih rentan terhadap perforasi usus daripada pasien dewasa. Pada pasien dewasa yang menggunakan shunt, salah satu faktor risikonya adalah berhubungan dengan Persistent Vegetative State (PVS) dan imobilisasi kronis, seperti yang dijelaskan dalam kasus ini. Faktor risiko perforasi usus pada orang dewasa cukup berbeda dari anak-anak. PVS dengan imobilisasi kronis adalah salah satu faktor risiko yang harus diperhatikan.*

**Kata kunci:** *Ventriculoperitoneal shunt; transanal extrusion; persistent vegetative state; pasien dewasa*

**Correspondence:** Asra Al Fauzi, Department of Neurosurgery, Faculty of Medicine, Universitas Airlangga, Dr. Soetomo Academic Medical Center Hospital, Jalan Prof. Dr. Moestopo 6-8, Surabaya 60286, Indonesia. Mobile phone : +6281-333934999, Fax : +6231-5025188, E-mail : asra-a-f-11@pasca.unair.ac.id

## INTRODUCTION

Ventriculoperitoneal (VP) shunting is the most widely used procedure in the treatment of hydrocephalus (Sathyanarayana et al 2000, Vinchon et al 2006, Matsuoka, Takegami & Maruyama, 2008, Filho et al 2013). The procedure is associated with various complications (Sridhar & Karmarkar, 2009, Glatstein et al 2011, Yilmaz et al 2011). The common complications are infection, malfunction due to blockage, disconnection, migration and shunt failure (Sathyanarayana et al 2000, Vinchon et al 2006, Matsuoka, Takegami and Maruyama, 2008, Glatstein et al 2011, Filho et al 2013). The reported incidence of abdominal complications is 5% - 47% (Yazar et al 2012, Filho et al 2013). Bowel perforation and spontaneous extrusion of distal catheter through the anal orifice especially in adult case are very rare and only few cases reported in the literature (Sathyanarayana et al 2000, Birbilis et al 2009, Filho et al 2013). The author reporting one such rare case of transanal extrusion of peritoneal catheter in adult patient.

## CASE REPORT

A fifty-one-year-old PVS and a bedridden male patient were brought to our hospital after his family noticed a VP shunt catheter extruding from his anus. One year earlier, the patient had undergone VP shunt placement for hydrocephalus following craniotomy for traumatic subdural hemorrhage after severe head injury. Postoperatively the patient was in PVS and continued for home nursing. He is in bedridden state and in continuous nasogastric tubing for his routine diet. One week before admitted to the hospital, he suffered from repeated diarrhea and then in the following day his wife noticed a tube came up from the anus. On examination, there was a tip of the peritoneal catheter extruded five centimeters from the anus and no cerebrospinal fluid drip was detected. There was no sign of meningeal sign or increased intracranial pressure, no distention or abdominal tenderness. The patient was in PVS with spontaneous eye opening and no verbal contact. The result of laboratory examinations showed no infection process with hypoalbuminemia and anemia. Abdominal x-ray film demonstrated the peritoneal catheter entering the descendent colon and exiting through the anus (Figs. 1 and 2).

The patient underwent emergency shunt removal. Analysis of the cerebrospinal fluid did not reveal any signs of infection. We removed the whole catheter and observed the patient for two days. External drainage was not performed. During the observation, there was no sign and symptoms of increasing intracranial

pressure. There were no signs of meningitis or peritonitis. After five days of treatment, the patient was discharged home in satisfactory result with the same permanent condition.

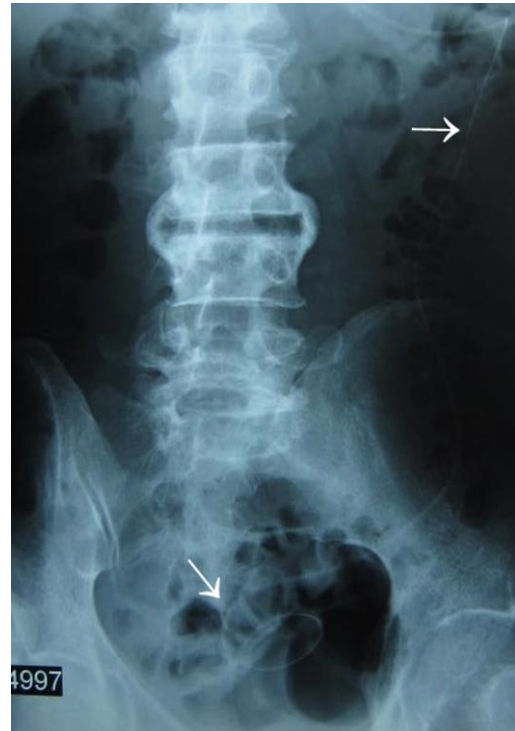


Fig. 1. Abdominal x-ray film of peritoneal catheter entering the descendent colon.

## DISCUSSION

The ventriculoperitoneal shunt has been the mainstay of treatment of hydrocephalus since the development of valve systems in the 1950s (Sathyanarayana et al 2000, Vinchon et al 2006, Matsuoka, Takegami and Maruyama, 2008, Filho et al 2013). Many complications that may follow the insertion of a VP shunt have been described (Sathyanarayana et al 2000, Vinchon et al 2006, Matsuoka et al 2008, Glatstein et al 2011, Filho et al 2013). The incidence of bowel perforation by peritoneal catheter has been estimated to range between 0,1 to 0,7% of shunted patients (Vinchon et al 2006, Murthy & Reddy 2009). Spontaneous bowel perforation is a rare complication of VP shunting and mostly affected pediatric patients (Sathyanarayana et al 2000, Birbilis et al 2009, Filho et al 2013). Anal extrusion has been reported in a minority of patients with bowel perforation (Vinchon et al 2006, Filho et al 2013).





Fig. 2. Peritoneal catheter exiting through the anus.

The exact pathogenesis of shunt-related organ perforation and extrusion through the anus is unclear, and various mechanisms have been suggested, including technical error, foreign body reaction, pressure necrosis and poor general condition with weakening of the intestinal wall and the stiff end off the shunt tube causing perforation (Sathyanarayana et al 2000, Vinchon et al 2006, Glatstein et al 2011, Filho et al 2013). Another mechanism proposed is occult shunt infection and chronic inflammation caused by intraoperative contamination (Vinchon et al 2006). The majority of cases in the literature had a delayed presentation after surgery, which suggests a chronic process rather than a traumatic or technical error. The risk factors for bowel perforation are age, male gender, poor general condition, malnutrition, infection and previous abdominal operation (Griffith & DeFeo 1987, Agarwal et al 2011, Filho et al 2013, Gupta et al 2014). Among these factors, age is a prominent factor for bowel perforation (Park et al 2000, Odeode 2007, Sinnadurai & Winder, 2009, Filho et al 2013). Because of weak bowel musculature and stronger peristaltic activity, children are more susceptible to bowel perforation than adult patients (Sathyanarayana et al 2000, Vinchon et al 2006, Glatstein et al 2011, Filho et al 2013). The majority of reports describe more children suffered than adults (Filho et al 2013). Seventy-eight percent of the reported cases occurred in children (Sathyanarayana et al 2000). In the present case, is a rare adult case, different from children, the possible mechanism of bowel perforation could be a persistent vegetative state with chronic immobilization that leads to continuous irritation of a fixed position of shunt tip that continuously erode and then finally perforate the organ. After perforated the bowel, the catheter propelled distally by peristalsis until the tip extruded through an anal orifice.

## CONCLUSION

Bowel perforation and transanal extrusion of VP shunt catheter is a rare but serious problem. In adult shunted patient, one of the risk factors is related to PVS with chronic immobilization, the clinician should be aware of this. We describe the extrusion of a VP shunt catheter through the anus in a 51-year-old persistent vegetative state male patient. Our case emphasizes the possible risk factors to be aware and the importance of early shunt removal to avoid further complications.

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