#### ROLE OF FLUOROSCOPIC GUIDED INTRAPERITONEAL PORT-A-CATH INSERTION IN THE MANAGEMENT OF CANCER OVARY

Thesis

Submitted for partial fulfillment of MD degree in radiodiagnosis

By

#### **Ahmed Hassan El-Sayed Mohamed Soliman**

M.sc. Radiodiagnosis
Faculty of Medicine- Ain Shams University

Under supervision of

#### Prof. Dr. Saad Ali Abd-Rabou

Professor of Radiodiagnosis Faculty of medicine - Ain Shams University

#### Prof. Dr. Maged Abou Seada

Professor of Obstetrics & Gynecology Faculty of medicine - Ain Shams University

#### Dr. Mohsen Gomaa El-Sharkawy

Ass. Professor of Radiodiagnosis Faculty of medicine - Ain Shams University

#### Dr. Hesham Ahmed El-Ghazaly

Ass. Professor of clinical Oncology Faculty of medicine - Ain Shams University

#### Dr. Mohamed Sobhy Hassan

Lecturer of Radiodiagnosis
Faculty of medicine - Ain Shams University

Faculty of medicine Ain Shams University 2013



### List of Contents

Subject	Page
List of abbreviation	
List of tables	
List of figures	
Introduction	
Aim of the work	
Review of literature	
Chapter (1)	
Anatomy Of The Ovaries	
Chapter (2)	
o Pathology Of Ovarian Tumors & Related	
Management Protocols	
Chapter (3)	
<ul> <li>Approach To Diagnose A Case Of Ca Ovary</li> </ul>	
Chapter (4)	
○ Treatment Protocols	
Patients and Methods	
Result	
Illustrative cases	
Discussion	
Summary and Conclusion	
References	
Arabic summary	

# List of Abbreviations

AUC	Area under time concentration curve
BEP	bleomycin, etoposide and cisplatin
CA	carcinoma
CA	Cancer antigen
CI	Confidence interval
СТ	Computed tomography
СТН	chemotherapy
EOC	Epithelial ovarian CA
ESMO	European society for medical oncology
FDA	food and drug adminstration
FIGO	International Federation of Gynecology and Obstetrics
FIPAD	fully implanted peritoneal access devices
FNA	Fine needle aspiration
GCT	Germ cell tumour
GI	gastrointestinal
GOG	Gynecologic Oncology Group
INR	International NormalizedRatio
IP	intraperitoneal
IV	Intravenous
NCI	National cancer institute
OS	Overall survival
PFS	Progression free survival

SCST	Sex cord stromal tumour
TAH & BSO	Total abdominal hysterectomy and bilateral salpingo-
	oopherectomy
VAC	Vincristine, Actinomycin, and Cyclophosphamide

## List of Tables

Table	Content	page
1	Features that Help Differentiate Serous from Mucinous	15
	Tumors	
2	TNM and FIGO Classifications for Ovarian Cancer	26
3	Anatomic stage/prognostic groups/FIGO stage	27
4	Age distribution among study cases	82
5	Most of the presented cases were staged to be in stage III	82
6	Exact placement of the port-A-cath were technically	83
	feasible in 90.9 % of patients	
7	Outcome according to response to chemotherapy	84
8	Remarks	85
9	Preprocedural ascites grade in CT pelviabdomen	85
10	Postprocedural ascites grade in CT pelviabdomen	86
11	Comparison of the pre and post procedure ascites grade in	87
	CT pelviabdomen	
12	Preprocedural peritoneal nodules assessment in CT	88
	pelviabdomen	
13	Postprocedural peritoneal nodules assessment in CT	89
	pelviabdomen	
14	Comparison of the pre and post procedure peritoneal	89
	nodules assessment in CT pelviabdomen	
15	showing the mean tumor marker level before and after	90
	peritoneal chemotherapy	

16	showing change in the tumor marker level before and after	91
	treatment , i.e. tumor marker dC value	
17	showing peritoneal port related complications	92
18	peritoneal chemotherapy related complications	93
19	Descriptive statistics Crosstab between different result to	94
1	assess peritoneal port-A-cath related complications among	
	different two different age groups as follows	
20	Descriptive statistics Crosstab between different result to	95
	assess peritoneal chemotherapy related complications	
	among different two different age groups	
21	Crosstab between whether the disease is primary or	97
	recurrent and the peritoneal port-A-cath related	
	complications.	
22	Descriptive statistics showing crosstab between whether	98
	the disease is primary or recurrent and the peritoneal	
	chemotherapy related complications which showed	
23	Descriptive statistics showing correlation between the	99
	presence of peritoneal port-A-cath related complications	
	and whether it is related to the tumor marker level before	
	and after application revealed	

### List of Figures

Fig.	Content	page
1	Ovarian ligaments	6
2	Histology of the ovary	8
3	Blood supply of the ovary	9
4	Diagram shows cell of origin for each type of ovarian cancer	13
5	Radiograph showing migration of the port-catheter tip to the right upper quadrant	52
6	Abdominal X ray demonstrating the dislodged intraperitoneal catheter separate from the Port-a-Cath	52
7	showing superficial abscess formation related to the site of port reservoir on axial and coronal CT cuts with confirmatory sonographic correlation	54
8	showingintraperitonealinflammatory process with abscess formation showing thick enhancing wall and peritoneal catheter seen intraperitoneal.	54
9	Choosing the puncture site over the right costal margin	63
10	Injection of xylocaine 2% at the site of angiocath introduction. In all of our patients, this site was the lower quadrant of the abdomen lateral to the course of inferior epigastric vessels. An appropriate insertion site at the right lower quadrant was locally anesthetized with Xylocaine 2 % before the puncture	63
11	Xylocaine 2 %	64
12	Introduction of the angiocath	64
13	Arrow showing tip of the angiocath guided by ultrasound within the patient's ascites	64
14	Amplatz super stiff guide wire	65
15	J- shaped tip of the stiff guide wire	65
16	guide wire introduction	65
17	positioning of the guide wire guided by fluoroscopy	66
18	Xylocaine infiltration with formation of subcutaneous bleb	66
19	tailoring the subcutaneous pocket for the port reservoir	67
20	port reservoir and lock	67
21	checking the tailored pocket to fit the port reservoir	68

22	metallic tunneler	68
23	showing introduction of the tunneler from the entry site till	69
24	it reaches the reservoir pocket	69
25	tailoring of the catheter to fit the patient built	70
26	anchoring the tip of the catheter at the site of the reservoir to the tunnler and then pulled along the created tunnel backward to the site of introduction of angiocath in to the patient's abdomen.	70
27	The tunnelar is pulled backward along the created tunnel to the site of introduction of angiocath into the ascites.	71
28	Needle access to the port is maintained to allow fixation of the port within its tunnel.	71
29	pill-away sheath locked	72
30	pill-away sheath unlocked	72
31	showing introduction of the pillaway sheath over the stiff	73
32	guide wire under fluoroscopy	73
33	removing the fixed sheath from the pillaway portion	74
34	introduction of the catheter into the pillaway sheath.	74
35	Peeling off the pillaway catheter with forward advancing of the catheter into the peritoneal cavity	75
36	Catheter seen within the peritoneal cavity guided by fluoroscopy	75
37	showing connecting the tip of the reservoir to the catheter	76
38	tip followed by application of the lock	76
39	implanting the port again into the tailored pocket	77
40	trial of aspiration confirming port patency	77
41	confirming its position under fluoroscopy	78
42	Technical success for port success.	79
43	Technical failure for port insertion	79
44	Illustrative diaghram showing comparison of the pre and post procedure ascites grade in CT pelviabdomen	88
45	Illustrative diagram showing pre and post procedure peritoneal deposit in CT pelviabdomen	90
47	Showing illustrative diagram representing the mean tumor marker level before and after peritoneal chemotherapy	91
48	illustrative diagram comparing different age groups and relation to peritoneal port related complications	95

49	illustrative diagram comparing different age groups and relation to peritoneal chemotherapy related complications	96
50	Illustrating descriptive statistics related to Port complications	100
51	Illustrating descriptive statistics related to Chemo complications	102
53	showing arrowed peritoneal nodule < 1 cm related to the inner aspect of the right lumbar region in great proxmity to the right kidney	103
54	showing peritoneal port-A-cath implanted over the left costal margin in axial and coronal views .	104
55	showing colored plate showing the implanted peritoneal port-A-cath after injection of low dose water soluble contrast media to ensure good peritoneal smearing and exclude peritoneal adhesions.	105
56	Digital radiograph showing peritoneal port-cath after implantation	104
57	showing colored plate and conventional CT cuts showing good placement of the peritoneal port-A- cath and smearing of the peritoneal reflections after injection of diluted water soluble contrast media	105
58	showing same axial CT cuts with total resolution of the previously noted peritoneal nodule after 6 cycles of combined IV/IP therapy	106
59	showing axial CT cuts with periotneal deposit implicating the peritoneal reflection at the subphrenic region. Periotneal port-A-cath is seen implanted over the right costal margin	107
60	showing metallic clips related to previous surgical interference.	108
61	Showing passage of the guide wire into the peritoneal cavity under fluroscopy followed by placement of the rubber catheter	108
62	plain radiography showing normal position of the implanted periotneal port-A-cath over the right costal margin	109
63	Colored plate demonstrating reformated CT images with	110

	MIP reconstruction showing normal position of the implanted periotneal port-A-cath over the right costal margin.	
64	showing axial CT cuts with total periotneal deposit that was seen implicating the peritoneal reflection at the subphrenic region	110
65	showing axial cuts showing massive free ascites .	111
66	showing multiple CT cuts with reformated images in coronal and saggital views of the same patient after receiving placement of the peritoneal port-A-cath and receiving combined IV / IP with near total resolution of the ascites, however multiple peritoenaladhesive bands was noted (white arrows) showing beak sign with secondary small bowel obstruction.	112
67	showing axial cuts ,pelvic CT with bilateral highly suspicious adenxal masses .	113
68	shows post implantation of the peritoneal port-A-cath over the left costal margin .	114
69	showing scar of TAH & BSO with periotneal port seen in the pelvis after the pateint received peritoneal chemotherapy and marvellous improvement of the tumor marker.	114
70	showing axial view, coronal and sagittal reforatted scans in a pathologically diagnosed ovarian CA patient showing massive free ascites and peritoneal nodule measuring+/- 1cm. Malpositioned catheter tip of the peritoneal port is seen insinuated between the greature curvature of the stomach and splenic hilum.	116
71	showing successful passage of the stiff guidewire into the peritoneal cavity under fluroscopic guidance	117
72	showing well placed port with the port reservoir seen implanted along the right costal mardin and the free catheter end within the peritoneal cavity.	118

73	showing arrowed high density material related to the port reservoir insertion site and relatively thickened soft tissue shadow compared to the left side.	118
74	showing coronal reformatted image with evidence of subcutaneous, pericathetersmudged fat planes with a small sinus reaching the skin surface (arrowed)	119
75	showing axial CT cuts comparing the pericatheter smudged fat pericatheter confirming the patients presenting complain and clinical presentation	119
76	Showing implanted peritoneal port-A-cath over the left costal margin with free tip in the peritoneal cavity.	120
77	showing axial CT cut, coronal reformated image and colored plate image with MIP coronal reconstruction confirming the position of the peritoneal port-A-cath.	121
78	showing multiple CT axial cuts showing huge pelviabdomen partially cystic, partially solid right adenxal mass	122
79	showing colored plate after implantation of peritoneal portcath	123
80	Showing multiple pelviabdomen axial CT cuts after peritoneal chemotherapy showing normal position of the peritoneal port with no residual or recurrent lesions.	124