



#### Purpose

To demonstrate that peritoneal dialysis (PD) can be effectively utilized in dialysis dependent patients with recurring ascites requiring regular paracentesis.

#### Background

Abdominal paracentesis involves the surgical puncture of the peritoneal cavity with a needle or placement of a catheter for the removal of excess fluid for diagnostic or therapeutic purposes. Complications may include; discomfort to patient, bleeding, infection, hypotension, and persistent leaking at puncture site.



### **Medical History**

End Stage Renal Disease (ESRD) – Hemodialysis dependent, recurring ascites requiring paracentesis bi-monthly, severe pulmonary hypertension, severe tricuspid regurgitation, right side heart failure due to valvular disease, ischemic cardiomyopathy, ventricular arrhythmia, myocardial infarction, carotid artery disease, coronary artery bypass graft, implantable cardioverter-defibrillator (ICD), single, in situ-St Jude Fortify, paroxysmal atrial fibrillation, chronic systolic heart failure, atrial flutter, diabetes mellitus type 2, hepatopathy, peripheral artery disease, peripheral vascular disease, bilateral above knee amputations, and artist. Transitioned to peritoneal dialysis for patient convenience.



# **Utilization of Peritoneal Dialysis in Patients with Ascites Terrie Colvard, BSN, RN, Nikeyia Davis, BSN, RN, CNN Greenfield Health Systems, Southfield, MI**

## Procedures

6/1/2016 - Transesophageal echocardiogram: Peritoneal dialysis catheter was inserted laparoscopically. Ascites fluid was drained gradually twice weekly with use of PD flushes until start of Continuous Ambulatory Peritoneal Dialysis (CAPD). Pre/Post sitting and standing blood CAPD training day, except day of home Severe tricuspid regurgitation secondary to a dilated annulus with failure of coaptation. Right ventricular enlargement. pressures and pulses were measured. Cultures, Gram stain, cell count, fungal, and acid-fast bacilli from ascites fluid was Mildly to moderately decreased right ventricular systolic function. Moderately decreased left ventricular systolic function. sent for analysis.

7/7/2016 - Right and Left Heart catheterization:

- 1. Elevated Biventricular filling pressures.
- 2. Pulmonary hypertension.
- 3. Normal cardiac output.
- 4. 3 vessel coronary artery disease.

5. 3/3 patent grafts (LIMA-LAD, SVG-Ramus, SVG-LPL)

7/14/2016 - Note: Has severe tricuspid regurgitation with marked abdominal ascites, and echo demonstrated the severe tricuspid regurgitation may be due to the lead of the ICD as there was restriction of the septal leaflet. Recommended to patient redo sternotomy and tricuspid valve repair versus replacement. Would be high – risk procedure. Understood and wanted to proceed also understood that it would take easily 6 to 12 months for ascites to resolve following resolution of tricuspid regurgitation. Redo sternotomy and complex tricuspid value repair with repair of the septal leaflet and bicuspidization of the posterior and septal leaflets and annuloplasty with a 28 millimeter annuoplasty ring. Close of surgery – transesophageal echocardiogram had some interference, therefore an epicardial echocardiography was performed which demonstrated trace regurgitation. Heart function was unchanged from preoperative study. 5/15/2017- Right heart catheterization:

Volume status: severely volume overloaded. Right heart filling pressures: severely elevated. Left heart filling pressures: severely elevated. Cardiac output: moderately reduced. Pulmonary vascular resistance: high.

5/16/2017 - Echocardiogram:

Markedly dilated right ventricle with severely decreased right ventricular systolic function. Mildly decreased left ventricular systolic function. Status post prosthetic ring in tricuspid annulus. Small pericardial effusion. Moderate tricuspid regurgitation.

### **Paracentesis**

Date	Amount	Description	RBC	WBC	Neutrophils	Albumin	Pathology	Post Scan
12/10/2015	5000 mL	Opaque, amber	23,000	380	3	1.5	no malignancy	residual remains
1/11/2016	8000 mL	opaque, pink	19,000	492	15	1.4		fluid collection
2/8/2016	9375 mL	opaque, amber						
3/21/2016	9350 mL	golden						min. residual
4/11/2016	7400 mL	opaque, yellow						small fluid
5/4/2016	9400 mL	cloudy, golden						no residual
6/13/2016	10,150 mL	cloudy, yellow						resolved collection
3/24/2016	10,000 mL	cloudy, straw	3,000	300	1			
7/12/2016	7000 mL	opaque, yellow						min. residual
7/20/2016	3550 mL	serosanguineous						small residual
8/26/2016	9000 mL	golden						min. residual
9/21/2016	9400 mL	cloudy, yellow						
10/5/2016	8250 mL	golden						
10/19/2016	7850 mL	golden						no residual
11/2/2016	9000 mL	cloudy, yellow						
11/16/2016	8100 mL	cloudy, yellow						
12/2/2016	7550 mL	golden						
12/14/2016	3400 mL	opaque, yellow						min. residual
1/4/2017	5150 mL	golden						min. residual
2/1/2017	8770 mL	golden						no residual
2/17/2017	8300 mL	amber						
3/8/2017	7000 mL	golden						
3/29/2017	8850 mL	yellow						min. residual
4/19/2017	9100 mL	opaque, amber						no residual
5/3/2017	9200 mL	cloudy, yellow						min. residual
5/18/2017	7200 mL	cloudy, yellow	< 3,000	325	4	1.7	no malignancy	no residual
5/31/2017	6250 mL	cloudy, yellow						no residual
6/14/2017	6450 mL	cloudy, yellow						no residual

Patient had paracentesis 28 times in a 1.5 year span (12/10/15 - 6/14/2017) initially once a month and progressed to every 2 weeks. Although ascites fluid was described as cloudy patient was asymptomatic and never received antibiotics.

#### Method

## **Catheter Placement and Flushes**

Laparoscopic insertion of peritoneal dialysis catheter on 6/28/2017. At time of placement 6000 mL ascites drained. Patient was flushed twice weekly after hemodialysis session until trained. Prior to flushing patient, ascites fluid was drained. Ascites drainage was stopped by nurse on all occasions. Ascites fluid ranged from 500 - 3500 mL. Patient's pre/post sitting and standing blood pressures and pulses was taken. Fluid was describes as cloudy and sent for multiple testing of cell count, gram stain, culture and sensitivity, fungal, and acid fast bacilli. White and Red count were always elevated, however no growth was ever reported. Patient remained asymptotic and antibiotics were not administered.







## Training

visit. At beginning of each training day patient drained ascites fluid. On day 2 of training ascites fluid stopped automatically. Each day fluid progressed from cloudy to clear. Cell count of effluent sent for analysis on several occasions. On 7/26/2017 cell count was compared with overnight and third exchange. Home visit completed afternoon of 7/27/17 and patient independently doing CAPD at home that evening.

Date	Exchange	Strength	Fill	Drain	Description	RBC	WBC	Neutrophils	Note
7/24/2017	overnight			3000 mL	yellow, cloudy	85	67	2	
	2	2.50%	2000 mL	3000 mL					
	3	2.50%	2000 mL	3400 mL					
	4	2.50%	2000 mL	3000 mL					
7/25/2017	overnight			2900 mL	cloudy	14	31		stopped automatically
	2	2.50%	2500 mL	3100 mL					
	3	2.50%	2500 mL	3000 mL					
	4	2.50%	2500 mL	2700 mL	clear				
7/26/2017	overnight			1100 mL	milky	103	199	11	
	2	2.50%	2500 mL	3500 mL					
	3	2.50%	2500 mL	3000 mL		16	22		
	4	2.50%	2500 mL	2600 mL	clear				
7/27/2017	overnight			1300 mL	milky, cloudy				
	2	2.50%	2500 mL	2700 mL					
	3	2.50%	2500 mL	3400 mL	clear				
	4								home visit

## **Dialysis at Home**

Patient independently doing CAPD at home starting evening of 7/27/17. Using 2.5 L of 2.5% Dineal from 7/28/17 - 8/3/17. First exchanges on 7/28/17, 7/29/17, and 7/30/17 effluent mostly clear. All other exchanges were clear. Starting 7/31/17 all effluent was clear. First exchanges on 7/28/17, 7/29/17, and 7/30/17 ultra- filtrated 800-1.4 L Starting 7/31/17 ultrafiltration was 200 - 400 mL.

Transitioned to Automated Peritoneal Dialysis 11/22/17 secondary to hospitalization for Left below knee amputation.

## 8/2/2017 Heart Failure Clinic note: ESRD now on peritoneal dialysis. Since then, he has not required paracentesis. Overall, his HF symptoms are better. Hx of ischemic cardiomyopathy, severe tricuspid regurgitation and prior TVR, signs of right and left sided heart failure, and ESRD on peritoneal dialysis. Better managed from a volume perspective and is very happy with peritoneal dialysis.

### Conclusion

Patient with recurrent ascites switching modality to peritoneal dialysis resulted in improved fluid removal and better management of the patient. Kt/V requirements being meet with zero episodes of peritonitis, tunnel, or exit site infections. At start of CAPD training patient had an albumin 2.9 and now stable at 3.2. It is presumed that peritoneal dialysis may not be a viable modality for patients with recurrent ascites and right side heart failure, however, our patient has proven that they can be treated with peritoneal dialysis and do well.

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