# An Analysis of Kidney Injury in Ovarian Cancer

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## Introduction

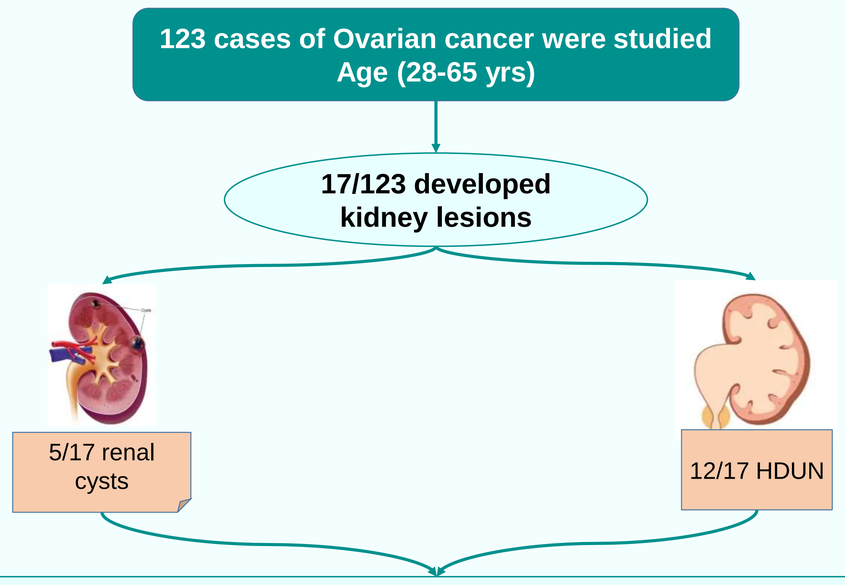
- Cancer of female genital organs is one of the causes of obstructive hydronephrosis
- Immediate management is required to prevent irreversible injury
- Galloway 1922 was the first to report renal disease in
  - Hodgkin's disease (3).
  - Pressure effect of ovarian cancer
- Needs emergency management
  - By placing a stent to bypass the blockage (4)

## Aim

- To find a predictive biomarker for the development of lesions in kidney in ovarian cancer

## Methodology

- Prospective observational study
- Ethical clearance was taken
- Study period: Jan 2018- July 2022
- we explored 123 cases of OC for the development of lesions in kidney
- We correlated the renal disease with various clinical parameters
  - Serum levels of HE4 & CA125
  - Stage of cancer
  - Glomerular filtration rate (GFR) at presentation
  - Recurrence
  - Mean values of serum levels of HE4 and CA125 were used




In this prospective observational study, we correlated renal disease with various clinico-pathological parameters like staging, recurrence, serum HE4 & CA125 etc. and tried to establish a correlation between ca ovary and kidney disease.

## Results

- On radiological investigations, two types of lesions were noticed
  - Hydronephrosis & Renal cysts, 17/123 (13.8%) of ovarian cancer
- 5 (4%) cases of simple cyst were seen
- In 12/123 (9.7%) of cases of hydroureteronephrosis (HDUN)
  - Left kidney: 8 cases
  - right kidney: 1 case
  - 3 cases showed bilateral involvement of the kidneys
  - Involvement of ureter was seen in all cases except one
  - Tumor stage: out of 12 cases
    - Stage I: 2, Stage II: 1
    - Stage III: 7, Stage IV: 2
  - Out of 12 cases, hypertension & DM were seen in 1 case each
  - Surgical resection was done in all cases:
    - Upfront surgery: 6 cases
    - NACT f/by surgery: 6 cases
    - No difference was in between the two groups
    - Reg. HDUN development
  - Metastatic lesions were seen in
    - Liver, perihepatic spaces, ileum, colon, lung, and spleen
  - Neither hematological parameters nor clinical parameters, like serum levels of HE4 or CA125, FIGO staging, recurrence, technique of surgery used, etc. could be determined to be associated with the development of secondary renal lesions.

- Others:
  - Pleural effusion : 2 cases
  - Fatty liver (grade I & II): 4 cases
  - Hepatomegaly: 4 cases.
  - Size of the ovarian cancer mass 7.0 cm to 17.0 cm.
- Increased ***CA125*** : 11/12 and of HDNU and 5/5 cases of cyst
- ***HE4*** was increased in 11/12 cases of HDUN and 5/5 cases of cyst.
- **Advanced stage (stage III & IV)**
  - ***HDUN :*** 11/15 (73.3%) of cases,
  - Simple cyst : 4/5 (80%) of cases.
- **Recurrence** of ovarian cancer was seen in
  - 8/12 (66.6%) cases with HDUN
  - 3/5 (60%) cases of the cyst.
- **The average *GFR*** was
  - 93.61ml/min in HDUN
  - 84.5ml/min in cyst cases.
- Hematological parameters, hemoglobin, total leukocyte count, and platelet counts were also analyzed, although no significant correlation could be established

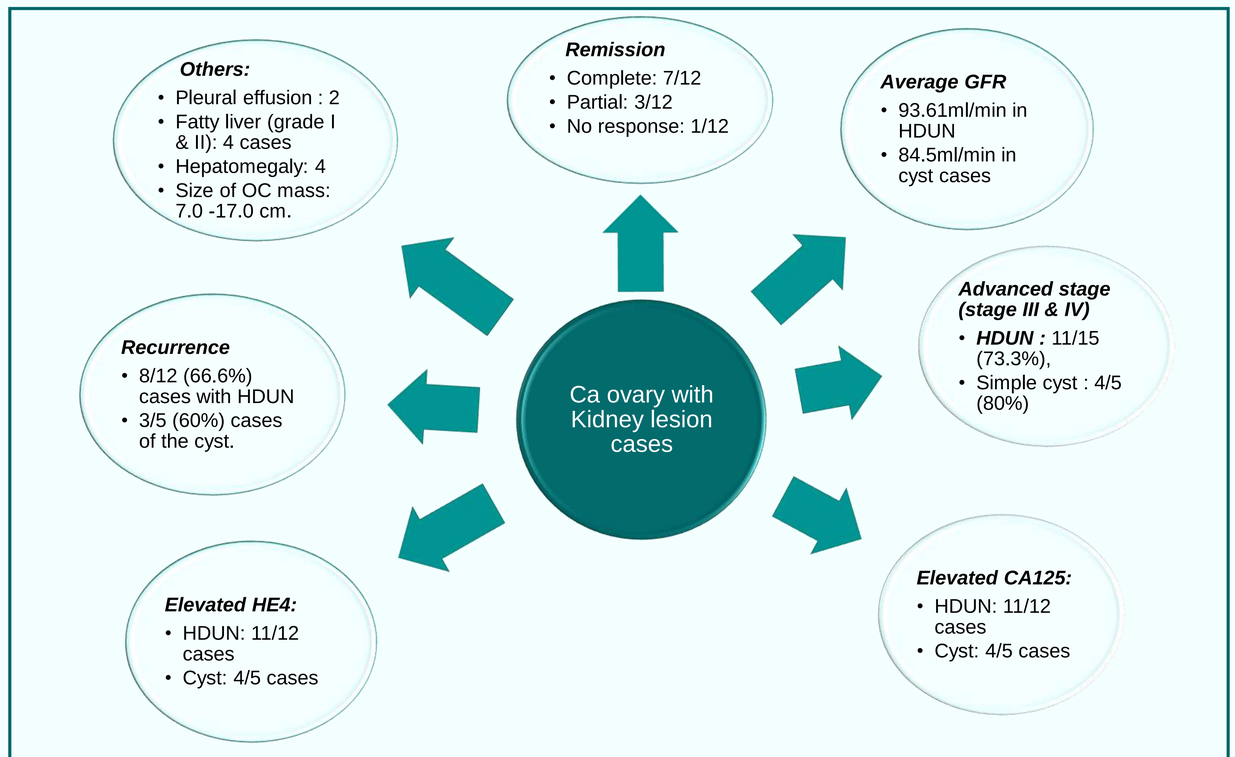



**Figure 2: Pictorial Representation of clinico-pathological parameters with kidney diseases in Ovarian cancer**

**Table 1: Clinicopathological parameters associated with HDUN and cyst of kidney in ca ovary and their correlation**

| | HDUN | Cyst | P-value |
|---|---|---|---|
| **No. of cases** | 12 | 5 | |
| **Mean CA125** | 1167.9 (11) | 466.5 (4) | 0.7531 |
| **Mean HE4** | 635.6 (6) | 560.4 (3)/ 90.6 | 0.2500 |
| **FIGO Staging** | | | |
| **Stage I-II** | 2 | 1 | |
| **Stage III-IV** | 11 | 4 | |
| **Mean TLC** | 8100 (mean) 9 | 11880 (2) | 0.4182 |
| **GFR** | 93.61 (5) | 84.5 (4) | 0.2500 |
| **Recurrence** | 8/12 (66.6%) | 3/5 (60%) | |
| **Mean Hb%** | 11.3 (9) | 11.95 (2) | 0.6909 |
| **Mean platelet count** | 292.2 (9) | 272 (2) | 0.9091 |

## Discussion

- Hydronephrosis: 7/12 cases in left kidney
  - While OC originates equally in both ovaries (6)
  - In this study is right and left ovary, 44 and 45, respectively
  - In pregnancy, higher incidence (HDUN) is seen in right kidney
    - Due to anatomical position of uterus (5).
- Cause of post-surgery HDUN is compromise of renal vasculature following surgery
- Renal cysts have no much clinical significance, as it subsides itself

**Table 2: Differential study details of our study and study done by B. Lund in 1982 on hydronephrosis in Ca ovary**

| Features | B. Lund Study (1989) | Our Study |
|---|---|---|
| **Total Cases of Ovarian Cancer** | 232 | 123 |
| **Hydronephrosis (Post chemotherapy)** | 22% | 9.7% |
| **Kidney Involvement:**<br>• **Unilateral**<br>• **Bilateral** | <br>77%<br>23% | <br>100%<br>0% |
| **HDUN in Advanced stage (III-IV)** | 73.3% | 67% |

## Conclusion

- Renal lesions was associated advanced stage of OC
- Recurrence was seen in 75% of cases with HDNU and 3/5 (60%) of cases with renal cysts
- Being unhealthy for a long time may result in to the development of secondary lesions in kidney
- Secondary renal lesion needs an urgent intervention to prevent irreversible injury
- In ovarian cancer, left kidney- hydronephrosis more common
  - HDUN may be an indication of ovarian pathology
- To find a predictive biomarker for the development of nephropathy needs a larger cohort
  - We couldn't see in the available literature, especially in the kidney lesions in OC

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