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RESEARCH ARTICLE

CASE REPORT: PROTEUS AS A CAUSE OF SECONDARY INFERTILITY.

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Abstract

Urinary tract Infections ascend uro-genital tract and cause infertility. The organisms which had been reported as causative for infertility include mycoplasma pneumonia, chlamydia trachomatis , tuberculosis and rarely others. Here In, We present a case of secondary infertility caused by proteus species for ten years. The case was unique because all other investigations for secondary infertility were normal. The findings of this case suggest that clinicians should maintain a high index of suspension for infections as a cause of infertility.

Introduction:-

In general, UTIs affect 150 million people each year worldwide, representing the most common infection after respiratory and gastro-intestinal infections[1].

Proteus mirabilis is gram negative facultative anaerobic, rod shaped bacteria shows swarming motility and urease activity and is widely distributed in soil and water.[2]The most common clinical manifestations of *Proteus* infection are urinary tract infections (UTIs)**.** Infertility has multiple causes including infections that cause tubal damage[3]**.** Apart from tetracycline and nitrofurantoin **,**Proteus mirabilis is generally susceptible to most antibiotics [2]but 10-20% of p.mirabilis strains are also resistant to first generation cephalosporin's andampicillin[4]

Case presentation:-

A 36 year old lady presented in November 2017 with history of secondary infertility for fifteen years. She had history of recurrent lower urinary tract infection. Her systemic examination was normal. She had no other co morbidity. Semen analysis and urogenital Sonography of her husband was normal. Her haemogram, electrolytes, blood sugar, Thyroid functions were within normal limits. Ultrasonography was normal. Hormonal profile was within normal limits Hysterosalpingography done five years back was normal .TORCH was negative. Initial cultures had not grown any organism. She was treated with macrolides, quinolones and cephalosporin's in past. We repeated her urine culture. It grew proteus species as shown in Fig 1. She was sensitive for Amikacin and Choloramphenical. Patient received Amikacin for one week as per body weight. Patient presented to OPD after one month with history of missed periods. Urinary beta HCG and Sonography confirmed pregnancy and patient delivered uneventfully after nine months.

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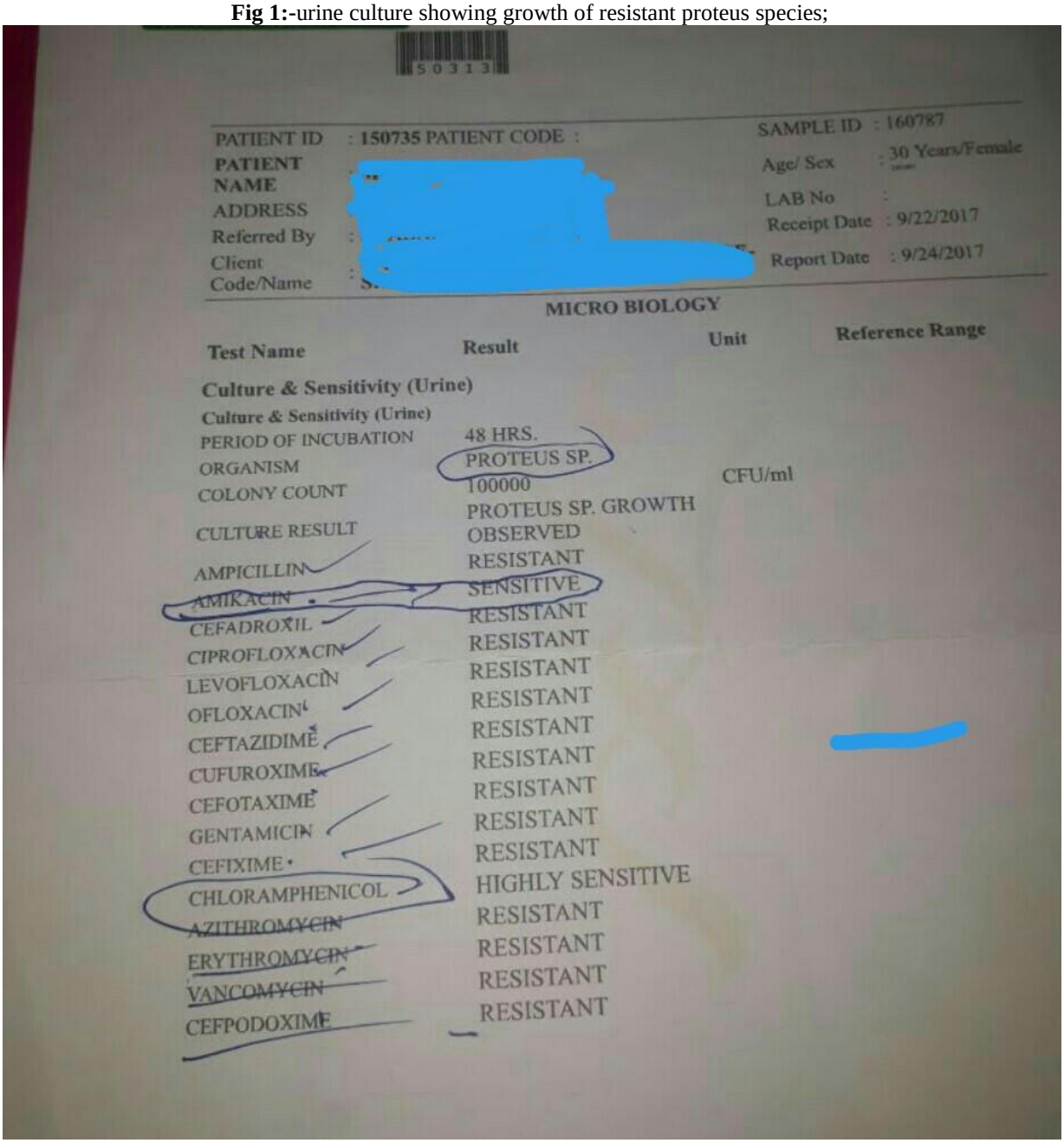
Fig 1:-urine culture showing growth of resistant proteus species;



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PATIENT ID : 150735 PATIENT CODE : SAMPLE ID : 160787
PATIENT NAME : [redacted] Age/ Sex : 30 Years/Female
ADDRESS : [redacted] LAB No :
Referred By : [redacted] Receipt Date : 9/22/2017
Client Code/Name : [redacted] Report Date : 9/24/2017

MICRO BIOLOGY

Test Name	Result	Unit	Reference Range
Culture & Sensitivity (Urine)			
Culture & Sensitivity (Urine)			
PERIOD OF INCUBATION	48 HRS.		
ORGANISM	PROTEUS SP.		
COLONY COUNT	100000	CFU/ml	
CULTURE RESULT	PROTEUS SP. GROWTH OBSERVED		
AMPICILLIN	RESISTANT		
AMIKACIN	SENSITIVE		
CEFADROXIL	RESISTANT		
CIPROFLOXACIN	RESISTANT		
LEVOFLOXACIN	RESISTANT		
OFLOXACIN	RESISTANT		
CEFTAZIDIME	RESISTANT		
CUFUROXIME	RESISTANT		
CEFOTAXIME	RESISTANT		
GENTAMICIN	RESISTANT		
CEFIXIME	HIGHLY SENSITIVE		
CHLORAMPHENICOL	RESISTANT		
AZITHROMYCIN	RESISTANT		
ERYTHROMYCIN	RESISTANT		
VANCOMYCIN	RESISTANT		
CEFPODOXIME			

Discussion:-

Since infertility has multiple causes and may not be recognized for years after Chlamydia or Mycoplasma infection has caused tubal damage. Tubal factor infertility impedes the descent of a fertilized or unfertilized ovum into the uterus through the Fallopian tubes and prevents a normal pregnancy and full term birth.The most common clinical manifestations of *Proteus* infection are urinary tract infections (UTIs). In general, UTIs are more common in individuals aged 20 to 50 years and most common in women of this age group. In healthy women, *Proteus* accounts for 1% to 2% of all UTIs (*E. coli* being the most common). Proteus accounts for 5% in hospital-acquired UTI and 20 to 45% in complicated UTIs (i.e., secondary to catheterization). Most uropathogenic bacteria belong to the intestinal microbiota which colonizes the perianal area of the patient [3]. Among the microrganisms most commonly found in urinary infections, Escherichia coli is highly represented with a rate of 75%–90% of incidence, but the frequency of infections caused by Proteus spp. is reported to be increased especially in the nosocomial context, or in complicated infections [5,6] On solid surfaces, P. mirabilis swimmer cells differentiate into elongated,

hyperflagellatedswarmerswhich exhibit an increased expression of virulence factors responsible for improving its ability to adhere to the urinary epithelium or to the polymers of the catheters. Swarming is regulated by more than 50 genes [7]. This differentiation is due to an overexpression of the wosA gene, which in turn increases the expression of the flhDC activator, a central component in the regulation of swarmer cell differentiation in P. mirabilis [8,9].The heterodimeric complex (FlhD2C2) increases 10-fold during the initiation of swarmer cell differentiation, activates the promoters for Class 2 genes in the flagellar cascade that encode the flagellar basal body and the sigma factor. The expression of σ 28 allows RNA polymerase to transcribe the Class 3 genes, which include flagellin, resulting in hyperflagellation of the swarmer cells [8]. Other proteus virulence factor is urease production which catalyzes the hydrolysis of urea to carbon dioxide and ammonia [10], elevates urine pH and promotes the sedimentation of calcium crystals (apatite) and magnesium ammonium phosphate ammoprecipitates (struvite) in urine and on catheters[11]. This results in formation of characteristic crystalline biofilm on catheters and kidney stone formation of P. mirabilis derived from the incorporation of crystals in the polysaccharidic matrices [12,13,14]. These biofilms favors the persistence of microorganisms in the urinary tract, protects from antibiotics and the immune response, and helps with access to the uro-epithelial surfaces, and the accumulation of ammonia becomes toxic for the uro-epithelial cells and induces direct tissue damage [7,15]. Though there is no direct evidence in literature supporting role of proteus as cause of infertility,The above mentioned phathophysiology could explain the long term damage it can cause in reproductive uroepithelium ,thus causing infertility.

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