

# Fertility preservation in girls: 6 years experience in a tertiary centre

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## Introduction:

Childhood cancer survival has improved greatly, leading to a growing population of girls at risk of premature ovarian insufficiency. Fertility preservation (FP) in the adolescent group represents unique challenges - physiological, medical, social and psychological - as this is a stage of substantial growth and change.

## Background:

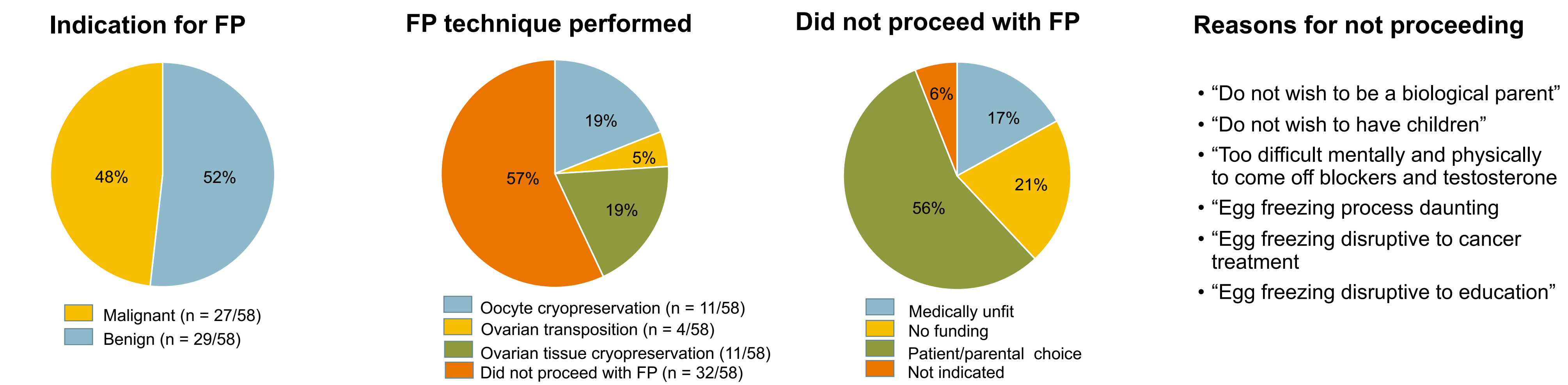
Oocyte cryopreservation (OC), ovarian tissue cryopreservation (OTC) and ovarian transposition (OT) are key techniques applicable in this population. Response to OC in adolescence has not been well studied. We report our clinical experience in managing girls undergoing FP.

## Methods:

This was a retrospective study of girls <18 years attending a specialist unit for FP between 2016 - 2021. Data was retrieved from a prospectively managed database.

## Results:

| Oocyte cryopreservation |           |        |        |        |        |        |        |           |        |         |         |         |
|-------------------------|-----------|--------|--------|--------|--------|--------|--------|-----------|--------|---------|---------|---------|
|                         | Case 1    | Case 2 | Case 3 | Case 4 | Case 5 | Case 6 | Case 7 | Case 8    | Case 9 | Case 10 | Case 11 | Case 12 |
| Age                     | 13        | 14     | 14     | 17     | 17     | 17     | 17     | 16        | 16     | 14      | 16      | 17      |
| AFC                     | Uncertain | 8      | 21     | 7      | 7      | 13     | 13     | Uncertain | 31     | 25      | 3       | 36      |
| AMH (pmol/L)            | 16.9      | 9      | 15.2   | 7.3    | 7.3    | 16.7   | 16.7   | 19.5      | 27     | 28.7    | 13.7    | 17.1    |
| Total stim dose (IU)    | 2925      | 5400   | 2875   | 4725   | 5175   | X      | 2775   | 3000      | 2250   | 3000    | 4275    | 2400    |
| Peak E2 (pmol/L)        | 2820      | 7143   | 14167  | 6622   | 4454   | X      | 1160   | 12555     | 23334  | 16073   | 6706    | 16283   |
| Total oocytes           | 4         | 14     | 17     | 4      | 6      | X      | 7      | 17        | 48     | 14      | 9       | 16      |
| Total MII oocytes       | 1         | 12     | 11     | 3      | 5      | X      | 4      | 17        | 35     | 12      | 9       | 13      |



| Ovarian tissue cryopreservation |                                         |                           |                   |                                 |                            |                                              |                            |                   |                  |                           |                        |
|---------------------------------|-----------------------------------------|---------------------------|-------------------|---------------------------------|----------------------------|----------------------------------------------|----------------------------|-------------------|------------------|---------------------------|------------------------|
|                                 | Case 1                                  | Case 2                    | Case 3            | Case 4                          | Case 5                     | Case 6                                       | Case 7                     | Case 8            | Case 9           | Case 10                   | Case 11                |
| Age                             | 13                                      | 14                        | 16                | 14                              | 14                         | 16                                           | 17                         | 15                | 13               | 15                        | 14                     |
| Indication                      | Myeloid sarcoma                         | Borderline ovarian tumour | Hodgkin's relapse | Neuro-ectodermal ovarian tumour | Hodgkin's relapse          | Osteosarcoma                                 | Hodgkin's (IIIB)           | Immature teratoma | Aplastic anaemia | Hodgkin's (IVB)           | Recurrent dermoid cyst |
| Treatment received before FP    | Fludarabine<br>Cytarabine<br>Idarubicin | -                         | Radiotherapy      | -                               | OEPA, COPDAC, radiotherapy | Methotrexate, Adriamycin, Cisplatin, surgery | OEPA, COPDAC, radiotherapy | -                 | ATG, CSA         | COPDAC                    | -                      |
| Treatment planned after FP      | Cyclophosphamide, Busulphan             | Surgery                   | HDCT and BMT      | Surgery                         | LEAM, BMT, radiotherapy    |                                              | HDCT and BMT               | Surgery           | BMT              | Pelvic radiotherapy       | Surgery                |
| Tissue stored                   | Whole ovary (R)                         | Whole ovary Both)         | Whole ovary (R)   | Whole ovary (R)                 | Cortex (R)                 | Whole ovary (R)                              | Whole ovary (R)            | Cortex (R)        | Whole ovary (R)  | Whole ovary (Both) and OT | Cortex (L)             |

**Results:** A total of 57 girls aged < 18 years (10-17 years) were referred, 23% (13/57) had previously received chemotherapy. Indications for FP included malignancy, immunological disorders, benign haematological disorders, recurrent ovarian cyst surgery and gender reassignment treatment.

## Results:

60% (34/57) did not proceed with FP, OTC was performed in 19% (11/57), OC in 16% (9/57) and OT in 7% (4/57). In the OC group, AMH was 7-28 pmol/L, AFC 7-36, and random-start with GnRH analogue trigger used in 78% (7/9).

Number of cryopreserved oocytes was 10-45 and number of MII oocytes 8-35.

## Conclusions:

This is the largest case series published in this population. FP in adolescent girls is associated with unique medical and ethical challenges, affecting treatment planning, decision-making, and consent. Services treating under-18s need to undertake an individualised assessment and provide all modalities of FP (OC, OTC, OT).