

You Don't See What You Don't Look For: The Impact of Missing Early Onset of Keratoconus

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Early stage identification is crucial for halting disease progression before vision loss. Identifying early disease requires a high degree of suspicion, knowledge of risk factors and subtle signs and symptoms as well as access to tomography technology.

Learning Objectives:

- 1) Attendees will understand prevalence of Kertoconus and the lifetime burden of not catching this disease early.
- 2) Attendees will understand early to late clinical diagnosis.
- 3) Attendees will understand treatment options and surgical trends.

- Prevalence:

- AJO Volume 259, p 71-78 March 2024
 - 69502000 patients enrolled in Medicaid and Children's Health Insurance Program reported to the CDC vision and eye health surveillance system were analyzed.
 - The incidence of Keratoconus was reported to be 0.04%
 - The average proportion of cases in the Black population (31.4%) reported annually was only slightly higher than that in Caucasians (29.7%) and Hispanics (30.2%). Rates were notably higher in Black women compared with Black men ($P=0.032$), while the least affected groups were Asians, Caucasians, and Native Americans, with the lower prevalence in Indigenous people possibly due to a disparity in claim rates.

- keratoconus was most prevalent in adults ages 18 to 39, with a slightly higher rate in women (52.5% vs 47.5% in men)
 - Front Pediatr. 2022; 10: 937246. Distribution of pediatric keratoconus by different age and gender groups
 - In a Chinese population: 446 keratoconus eyes in 266 pediatric patients from January 2019 to January 2022
 - male/female ratio was 353/93 (3.8:1), and the median age was 16 years (range: 6–17 years). Male patients were statistically younger than female patients ($P = 0.041$). The male/female ratio decreased with age (P for trend = 0.011). The distribution of the topographic keratoconus classification (TKC) stage was significantly different between gender and age groups (all $P < 0.05$). Male patients had a higher ratio of advanced keratoconus eyes (TKC ≥ 3) than female patients ($P < 0.001$), and CMH analysis indicated that being a male was a risk factor for advanced keratoconus after controlling for age (odds ratio: 2.581, $P < 0.001$).
- Lifetime cost of Keratoconus (AJO Volume 259, p 71-78 March 2024) (5 minutes)
 - The average per-person inflation-adjusted lifetime cost of keratoconus treatment in 2019 was nearly \$29,000, with a cumulative economic burden of \$3.8 billion.
 - indirect costs: work loss from vision impairment are a substantial component of economic costs
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- General overview of early vs late disease and why it is tough, yet essential to identify early
 - Early vs Late symptoms of disease
 - reported at diagnosis and in progressive disease
 - Early vs Late clinical signs of disease
 - at diagnosis and in progressive disease
 - Early vs late topographical signs
 - Diagnosis

- Progression
- Treatment paradigms for early vs late disease
 - can discuss behavior modification, CXL, INTACS, Lenses, PK, DALK etc
 - Has new treatments modified the rate of PKP?
- Eye Banking Statistical Report 2021

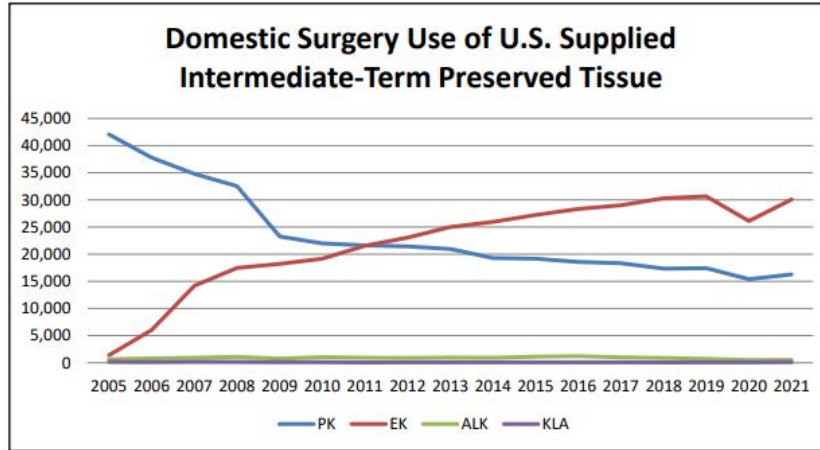
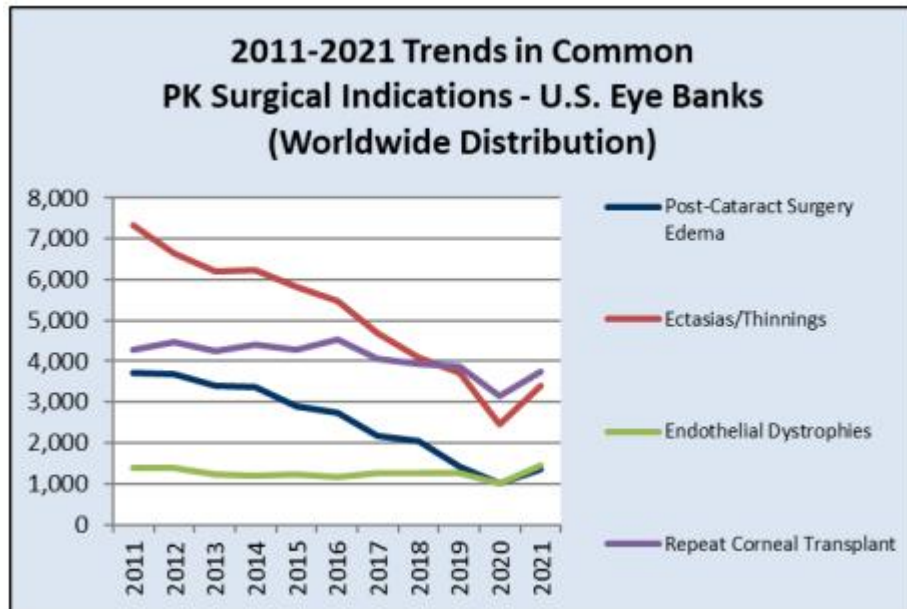
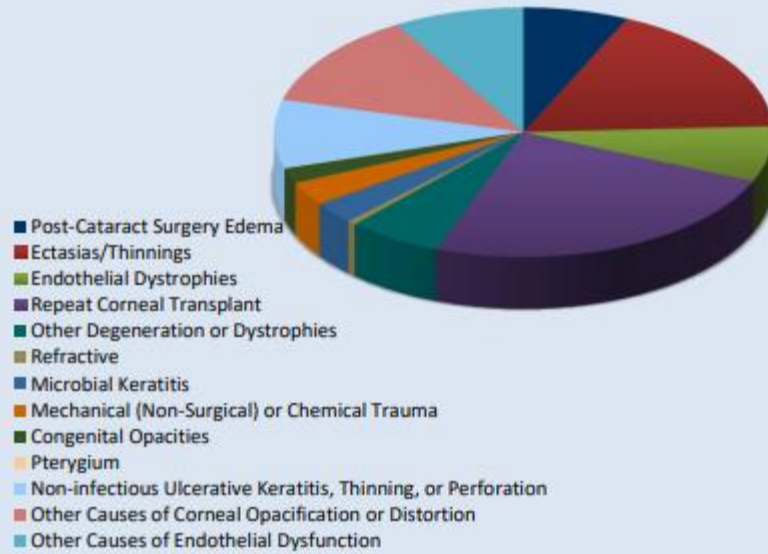


Figure 4: Domestic PK vs. EK vs. ALK Surgery Trends. The relative frequency of PK, EK, and ALK procedures performed in the U.S. over the last 17 years can be seen above. In 2012, the EK procedures exceeded PK. While all procedures increased in 2021 compared to 2020, only EK returned close to pre-COVID numbers.



2021 Indications for Penetrating Keratoplasty - U.S. Eye Banks (Domestic Distribution)



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- Instances where it may be challenging to use standard paradigms of typical symptomatology, clinical signs, topography and some approaches to approaching these: syndromic patients, nonverbal patients, children