



8

Ulusal



Endokrin Cerrahi Kongresi

27-30 Nisan 2017 Gloria Kongre Merkezi ANTALYA

**Paratiroid Cerrahisinde
Başarısızlık Sebepleri**



**Paratiroid Cerrahisinde
Başarının Sırları**

**BÜLENT ECEVİT
ÜNİVERSİTESİ
TIP FAKÜLTESİ**

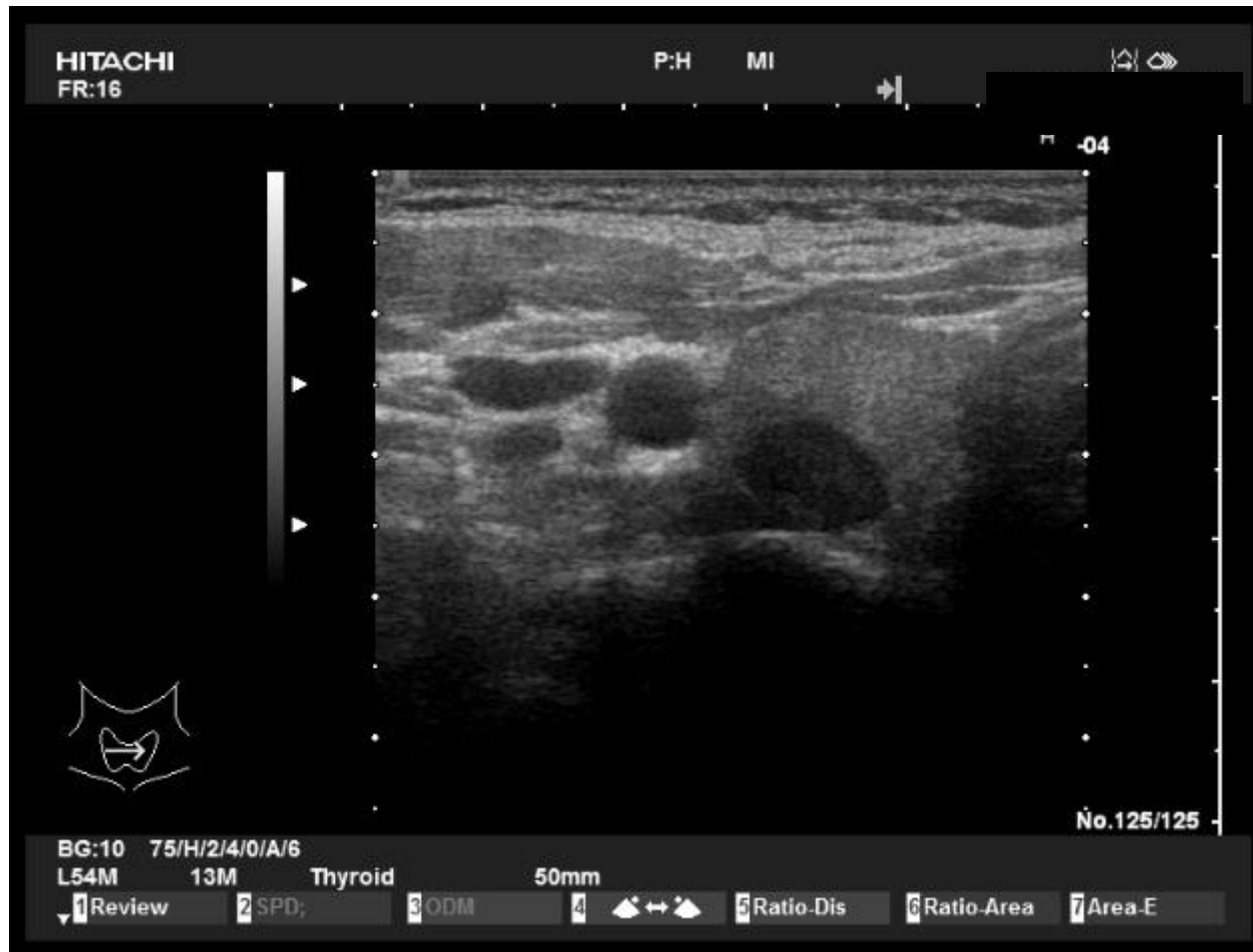
- **"Paratiroid cerrahisinin başarısı, cerrahın paratiroidi gördüğünde tanıyabilme yeteneğine, bezin saklanabileceği yerlerin dağılımını bilmesine ve teknik olarak bu bilgileri kullanabilecek kadar nazik olabilmesine bağlıdır"**

- **Edward Delos Churchill, 1931**

Vaka:Primer Hiperparatiroidizm

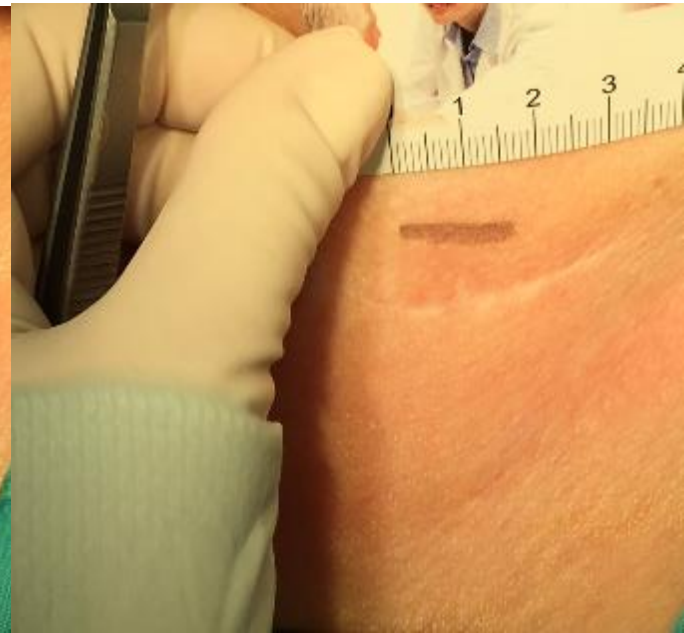
- 55 y kadın hasta
- Osteopeni nedeniyle medikasyon+
- Hiperkalsemi 11.3-11.5 mg/dL
- PTH 145 pg/mL
- Kemik ağrısı, böbrek taşı, kognitif bozukluk, karın ağrısı vs. yok
- Aile hikayesi yok
- İyonize radyasyon hikayesi yok

Vaka:Primer Hiperparatiroidizm



Vaka:Primer Hiperparatiroidizm

- Endokrin konseyi
- USG rehberliğinde hedeflenmiş sağ paratiroidektomi planı
- Preinsizyon USG
 - Lezyon konfirmasyonu ve insizyon planı



Vaka:Primer Hiperparatiroidizm

- 2 cm. insizyon, strap kaslar laterale retrakte edildikten sonra tiroid sağ lob çevresi eksplore edildi

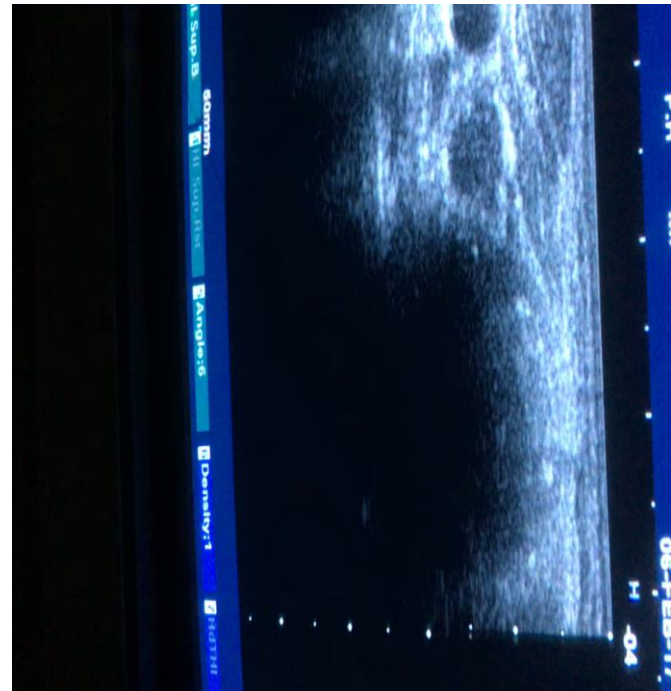


PARATİROİD BEZİ YOK

Vaka:Primer Hiperparatiroidizm

Intraop. US tekrarı
Lezyon +

Intraop. US rehberlikli İİABx
PTH>3384 pg/mL



Vaka:Primer Hiperparatiroidizm

- Sağ lobektomi
– IOPTH 25 pg/mL.



Başarılı Cerrahi

1. Doğru hasta

2. Doğru ameliyat

3. Doğru anatomi ve embriyoloji bilgisi

4. Doğru eksplorasyon

5. Doğru ekipman

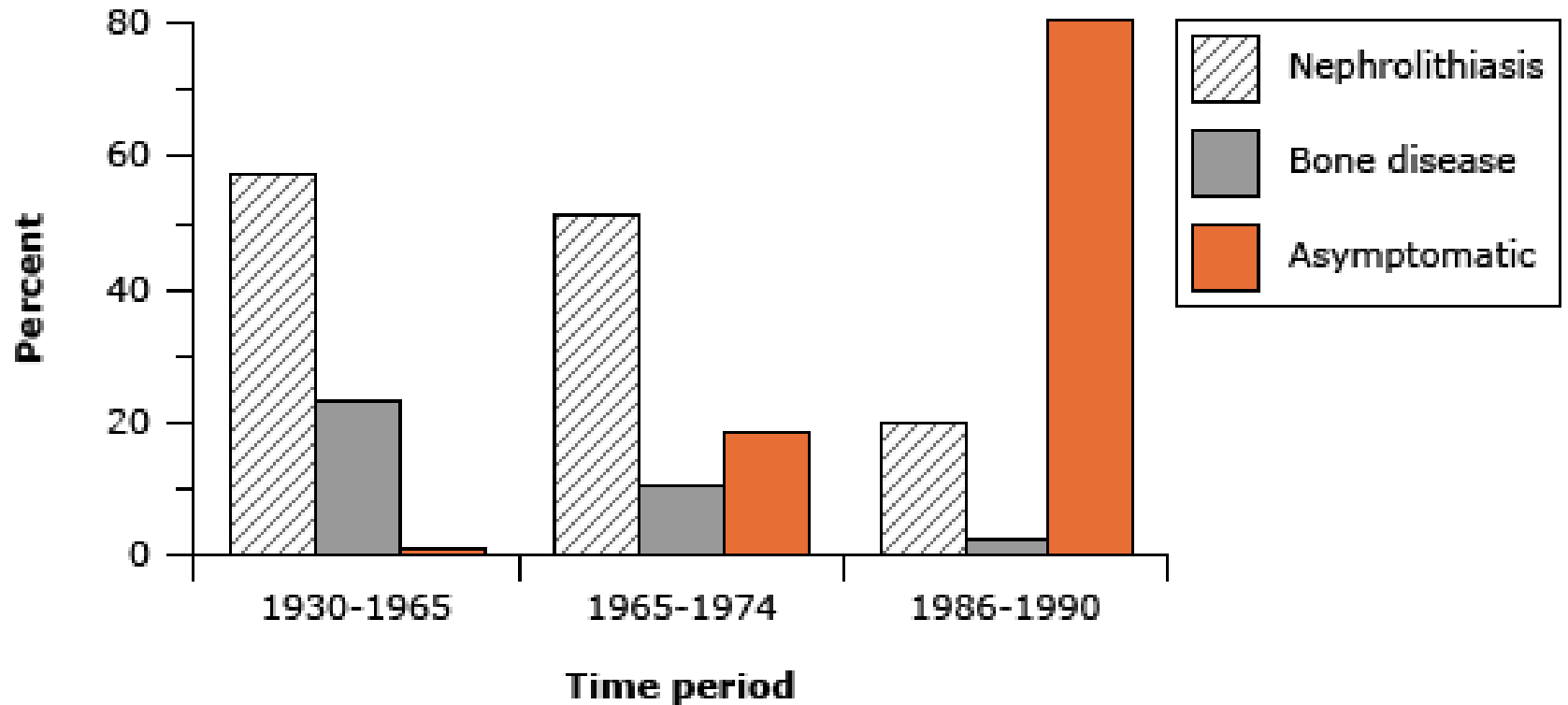
Doğru Hasta

Hastada PHPT var mı?

- İlk olarak doğru tanı ve endikasyon
 - Biyokimyasal tanı
 - Serum kalsiyum > 10.1 mg/dL
 - Serum PTH > 65 pg/mL
 - İdrar Ca eks. > 400 mg
 - Serum fosforü düşük veya düşük-normal
 - Serum klor/fosfor oranı > 33
 - ALP, ürik asit, kreatinin, vit D.
 - BFHH - Sekonder HPT tanıdan dışla

PHPT

Değişen Prezantasyon



Doğru Hasta

Hastanın cerrahi ihtiyacı var mı?

Summary of the most recent international consensus guidelines for the management of asymptomatic primary hyperparathyroidism, 2013

Criterion	Indication for Surgery
Age	<50
Calcium	>1 mg/dL above upper limit of normal range
BMD	1. T-score ≤ -2.5 at any site (osteoporosis) 2. Vertebral fracture on imaging
Renal	1. Creatinine clearance <60 mL/min 2. 24-h Urine calcium >400 mg/dL + increased stone risk 3. Nephrolithiasis or nephrocalcinosis by imaging

Doğru Ameliyat

Bilateral boyun eksplorasyonu (4 bez)

Unilateral boyun eksplorasyonu (2 bez)

Hedeflenmiş eksplorasyon (1 bez)

BNE vs MIP

Randomize Çalışmalar

Authors	No. of patients	Randomized group (no.)	Results
Slepavicius [83]	48	MIP (24), BNE (24)	No difference in OR time, cosmesis at ≥ 1 year, or cure rate (100 % in both arms); less pain, better cosmesis at <1 year in MIP group; lower cost in BNE group
Miccoli [84]	40	Video-assisted MIP (20), endoscopic BNE (20)	No difference in OR time, complications (none), cure rate (95 % MIP, 100 % BNE); 3 BNE patients with single adenoma had additional “unnecessary” glands removed
Aarum [85]	100	MIP (50), BNE (50)	No difference in cure rate (96 % MIP, 94 % BNE); cost 21 % higher for MIP group; >50 % of MIP group actually underwent bilateral exploration
Sozio [86]	69	Radio-guided MIP (34), BNE (35)	No difference in cure rate (100 % in both arms); shorter OR time, LOS, and recovery time in MIP group
Bergenfelz [87]	50	MIP (25), BNE (25)	No difference in cure rate (96 % MIP, 100 % BNE); shorter OR time, less short-term hypocalcemia in MIP group
Bergenfelz [13] and Westerdahl & Bergenfelz [51]	91	Initial study: MIP (47), BNE (44); 5-years follow-up: MIP (38), BNE (33)	No difference in cost, temporary nerve palsy (2 MIP, 1 BNE), short-term cure rate (98 % in both arms), long-term cure rate at 5 years (89 % MIP, 94 % BNE); shorter OR time, less short-term hypocalcemia, less early severe symptomatic hypocalcemia, less long-term hypocalcemia in MIP group; 1 BNE patient with single adenoma still dependent on calcium/calcitriol at 5 years
Miccoli [88]	38	Video-assisted MIP (20), BNE (18)	No difference in cure rate (100 % in both arms); shorter OR time, less pain, better cosmesis in MIP group; no complications in BNE group vs. 1 RLN palsy in MIP group

BNE bilateral neck exploration, *LOS* length of stay, *MIP* minimally invasive parathyroidectomy, *OR* operating room, *RLN* recurrent laryngeal nerve

Doğru Ameliyat

Kritik Teknik Noktalar

- Sahada kan olmaması
- Titiz diseksiyon
- Aydınlatma, ekpozür, muhakeme yeteneği
-
-  **TECRÜBE** 

Doğru Ameliyat?

Görüntüleme yöntemlerinin rehberliği

Table 17.2 Summary of parathyroid localization studies

Modality	Advantages	Limitations	Radiation	Performance
Ultrasound	- Inexpensive - Portable units are available - Often located in offices where patients with 1° HPT are routinely followed (i.e. endocrinology)	- Highly dependent upon the experience of the operator - Ultrasonographically “silent” anatomic locations, i.e. retro-esophageal groove or the mediastinum - Multinodular thyroid disease - Patients with a short or thick neck - Limited sensitivity for small parathyroid adenomas - Limited sensitivity for multi-gland parathyroid disease	None	- Sensitivity: 70–96 % - Specificity: 50–100 % - Accuracy: 86.2–98 %
MRI	- May be useful for imaging of pregnant patients - Useful for identification of ectopic parathyroid glands	- Expensive - Limited sensitivity for small parathyroid adenomas - High-resolution machines are not available in many smaller facilities	None	- Sensitivity: 64–89 % - Specificity: 75–89 % - Accuracy: 64–84 %
Planar Scintigraphy	- Simple to interpret - Useful for identification of ectopic parathyroid glands	- Limited sensitivity for small parathyroid adenomas - Limited anatomic information - Time-consuming to perform	6.7–7.8 mSv	- Sensitivity: 54–88.2 % - Specificity: 87.8 % - Accuracy: 88.0 %
SPECT	Improved localization and anatomic information compared to planar scintigraphy	- Limited sensitivity for small parathyroid adenomas - Limited sensitivity for multi-gland parathyroid disease	6.7–7.8 mSv	- Sensitivity: 74–87 % - Specificity: 84 % - Accuracy: 83.4–94 %
SPECT/CT	Further improvement of localization and anatomic information beyond SPECT	- Large dose of radiation - Limited sensitivity for small parathyroid adenomas - Limited sensitivity for multi-gland parathyroid disease	18.4 mSv	- Sensitivity: 84.4–86 % - Specificity: 89.4–90.4 % - Accuracy: 78–88.8 %
4D CT	- Improved localization of ectopic parathyroid adenomas - Useful for identification of multi-gland parathyroid disease - Can detect parathyroid glands as small as 3 mm	- Large dose of radiation - Time-sensitive imaging protocol; technical errors can render results useless - False positives may be seen with vitamin D deficiency and multi-gland parathyroid disease	10.4–13.8 mSv	- Sensitivity: 92.1 % - Specificity: 95.6 % - Accuracy: 88.2–94.7 %
¹⁸ F-Fluorocholine-PET/CT	- May accurately localize lesions that were not identified using ultrasonography and/or sestamibi imaging - Lower radiation dose than SPECT/CT and 4D CT	- Expensive - Requires specialized facilities and equipment	5.2–6.7 mSv	- Sensitivity: 81–89 % - Specificity: 78 % - Accuracy: 80 %

Preoperatif paratiroid lokalizasyonu için görüntüleme yöntemlerinin tanısal etkinlikleri

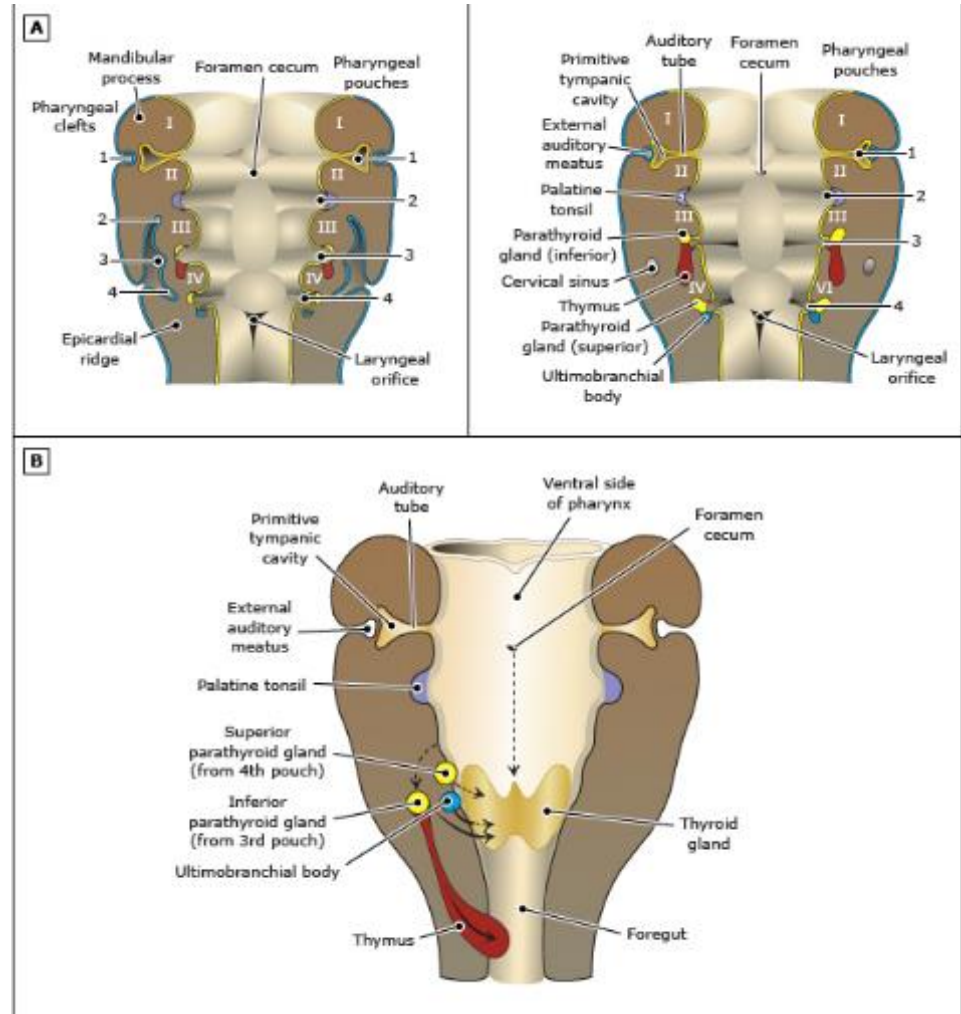
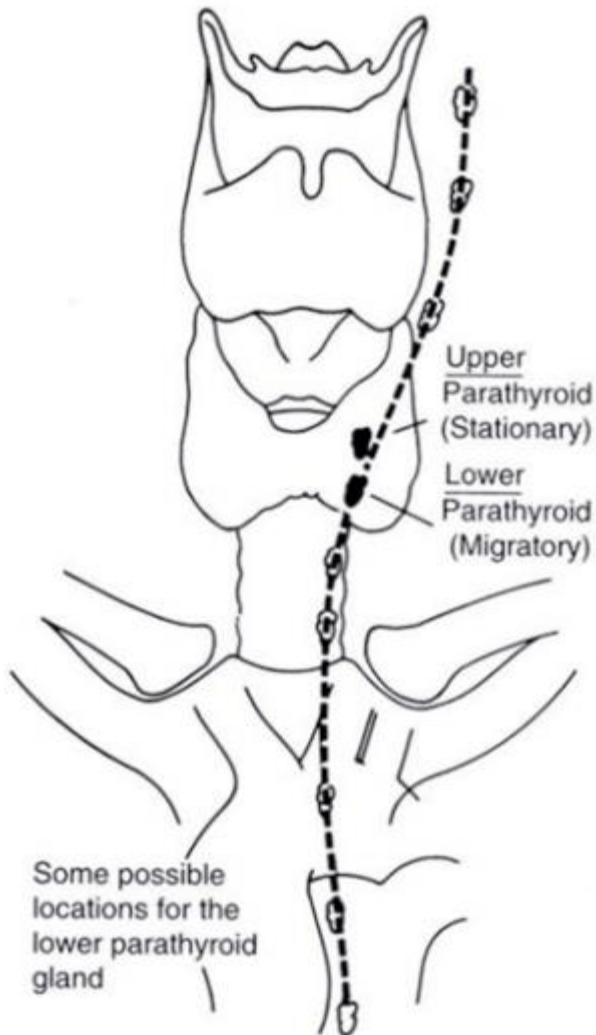
Tablo 2

Scintigraphic localization sensitivities for smaller versus larger parathyroid lesions

	Early Images (%)	Late Images (%)	Subtraction Images (%)	SPECT (%)	Early and Late Images (%)	Planar Images (%)	All Images (%)
All Lesions							
<600 mg	58 ^a	69 ^a	74 ^a	77 ^a	77 ^a	83 ^a	86 ^a
>600 mg	76	90	88	90	91	94	94
SGD							
<600 mg	68 ^a	78 ^a	83 ^a	86 ^a	86 ^a	93 ^a	96
>600 mg	80	95	92	94	95	99	99
MGD							
<600 mg	39	52	53	55	59	61	62
>600 mg	42	49	56	64	63	66	69

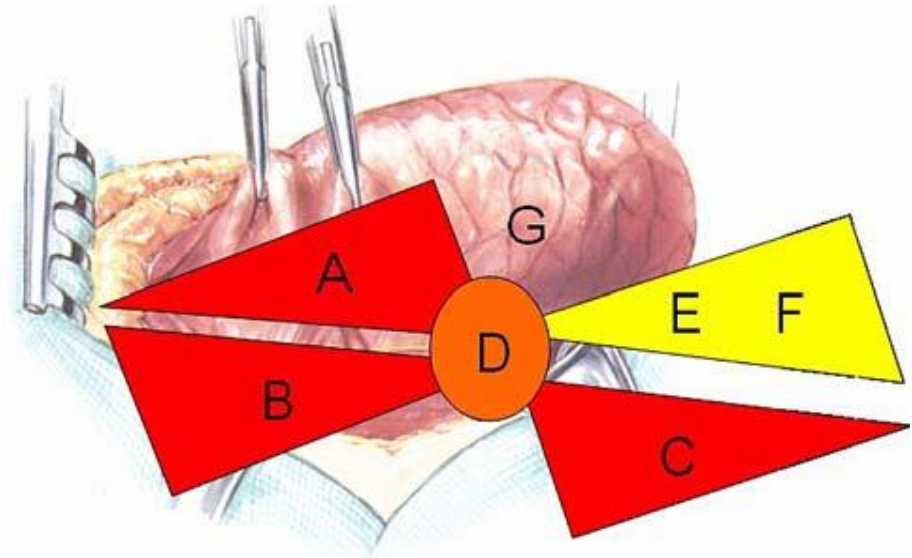
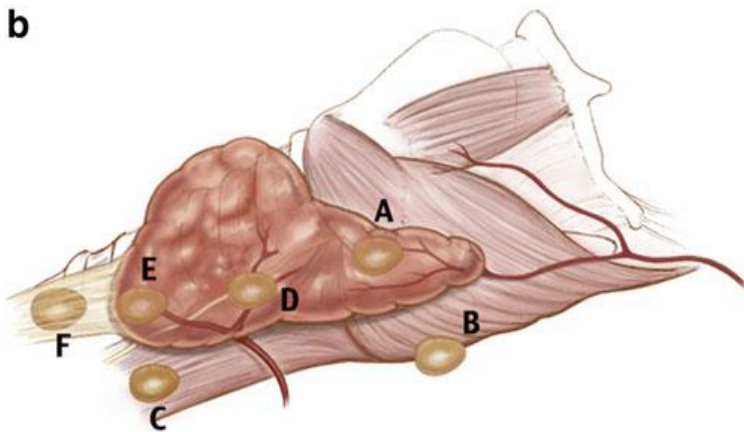
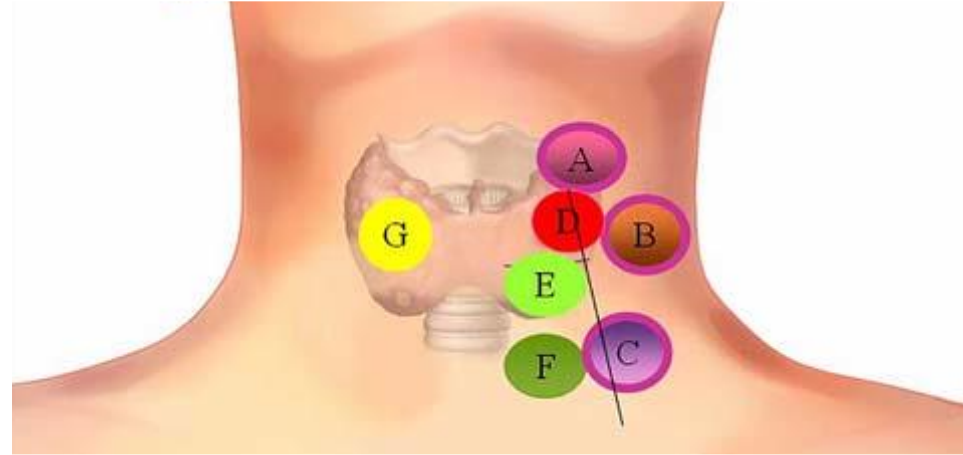
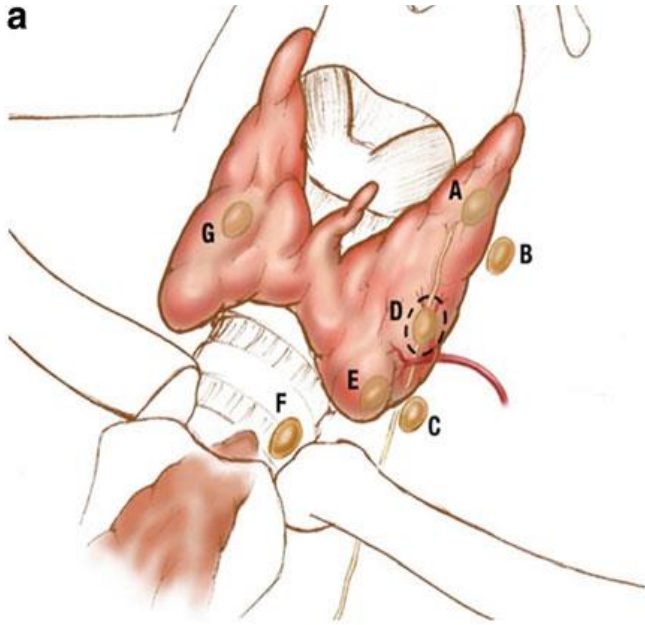
Anatomi ve Embriyoloji

Hastalıklı Bez Nerede?



Paratiroid Adenom Lokalizasyonu

Ortak Dil



Doğru Ameliyat

İntroperatif sekans geliştirme

- BNE ihtimalini azaltma
 - En sık lokalizasyonlar
 - Trakeözofageal groove
 - Retroözofageal alan
 - Retrofaringeal alan
 - Tirotimik ligaman
 - Karotis kılıfı
 - Birden çok bez olasılığı
 - » başarısız vakaların %15-25'i (Henry JF World J Surg 1990;14:303)
 - Intratiroidal
 - Mediastinal
 - » başarısız vakaların %5-11'i (Conn JM Am Surgeon 1991;57:62)

Doğru Ameliyat

İntroperatif sekans geliştirme

- 1. Şüpheli tiroid nodülünden İİABx ile PTH
- 2. Diğer tarafı explore et, simetrisine bak
- 3. Yıka, aydınlat, ekspozürü kontrol et
- 4. Meslektaşını çağır
- 5. DUR

Doğru Ekipman - Tetkik

Hangi cerrahi yandaşları kullanmalıyız?

- IOPTH
 - Soliter adenomlu hastaların %85'inde mükemmel sonuç
 - Çift adenomlu hastaların %50'sinde yardımcı
 - Modifiye Miami Kriterleri
- Frozen section
 - Adenom/hiperplazi ayrımı yapmaz
 - Konkordan görüntüleme varlığında IOPTH olmadan konfirmasyona yarar

IOPTH

Commonly used intraoperative parathyroid hormone monitoring criteria for predicting outcomes of parathyroid surgery

Criterion	Definition	Sensitivity, %	Specificity, %	Accuracy, %
Miami ⁵³	Decay $\geq 50\%$ from highest baseline value within 10 min after resection	98	94	97
Halle ⁵⁰	Decay into the low normal range (≤ 35 pg/L) within 15 min after resection	70	87	72
Rome ⁵⁴	Decay $\geq 50\%$ from highest baseline value, and/or 20 min postexcision value within reference range, and/or ≤ 7.5 ng/L lower than 10 min postexcision value	83	90	84
Vienna ⁵⁰	Decay $\geq 50\%$ from the preincision value within 10 min after resection	92	89	92
Charleston ⁵⁵	Decay $> 50\%$ from highest baseline value 10 min after resection and return to normal range or decay $> 65\%$, or decay $> 50\%$ and return to normal range within 20 min after resection	97	98	97

Intraoperatif Ultrasonografi

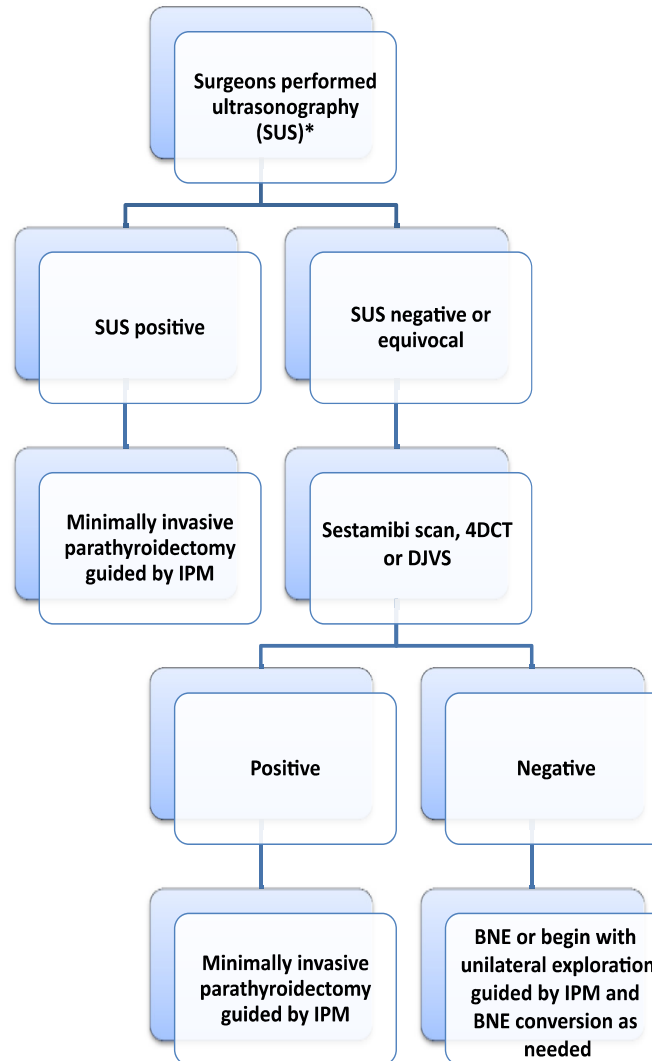






Sporadik Primer HPTH

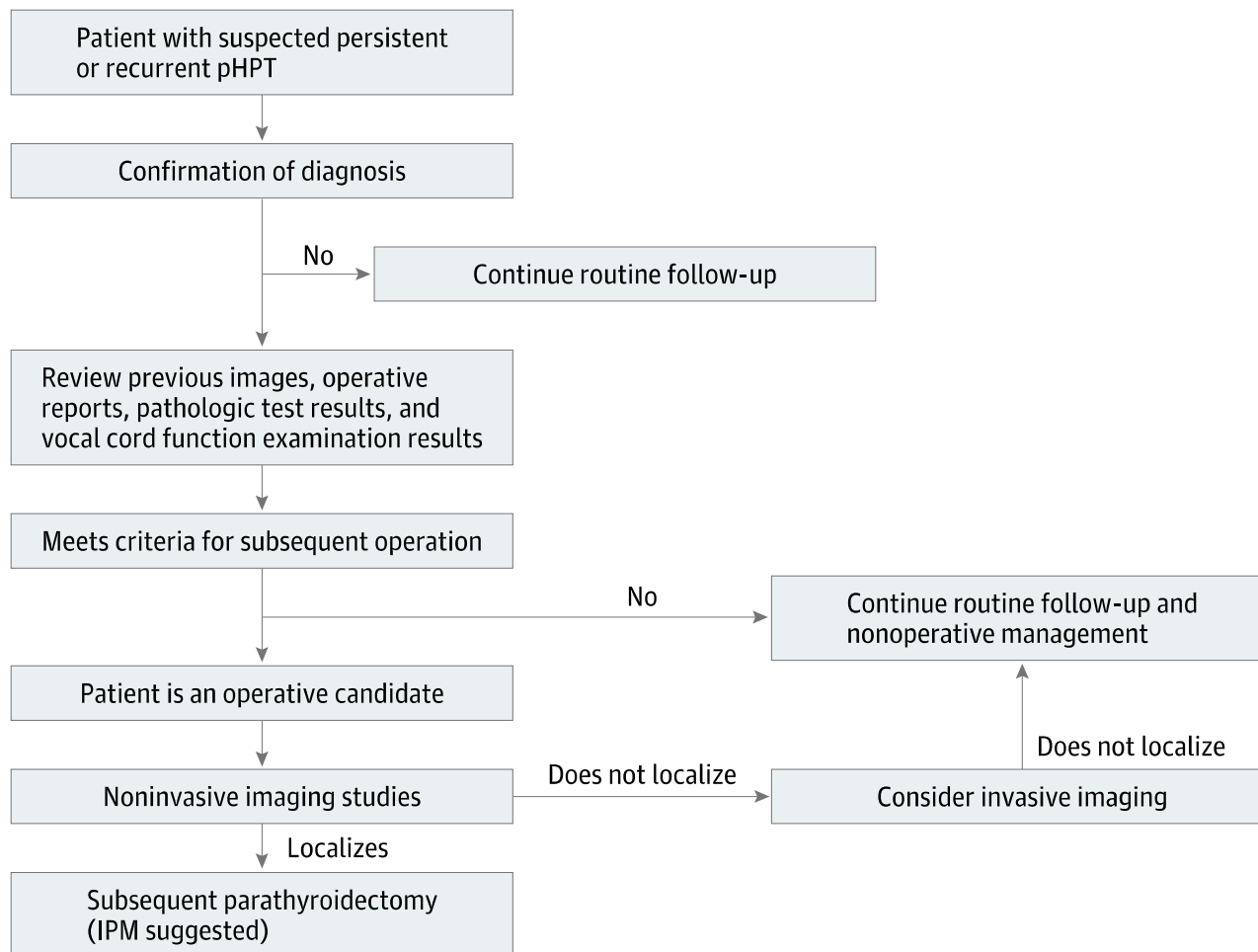
Preoperatif Lokalizasyon Algoritmi



The American Association of Endocrine Surgeons Guidelines for Definitive Management of Primary Hyperparathyroidism

Scott M. Wilhelm, MD; Tracy S. Wang, MD, MPH; Daniel T. Ruan, MD; James A. Lee, MD; Sylvia L. Asa, MD, PhD; Quan-Yang Duh, MD; Gerard M. Doherty, MD; Miguel F. Herrera, MD, PhD; Janice L. Pasioka, MD; Nancy D. Perrier, MD; Shonni J. Silverberg, MD; Carmen C. Solórzano, MD; Cord Sturgeon, MD; Mitchell E. Tublin, MD; Robert Udelsman, MD, MBA; Sally E. Carty, MD

JAMA Surg. 2016;151(10):959-968.



Trends in the Frequency and Quality of Parathyroid Surgery

Analysis of 17,082 Cases Over 10 Years

Amer G. Abdulla, MS, Philip H. G. Ituarte, PhD, MPH, Avital Harari, MD, James X. Wu, MD,
and Michael W. Yeh, MD

(*Ann Surg* 2015;261:746–750)

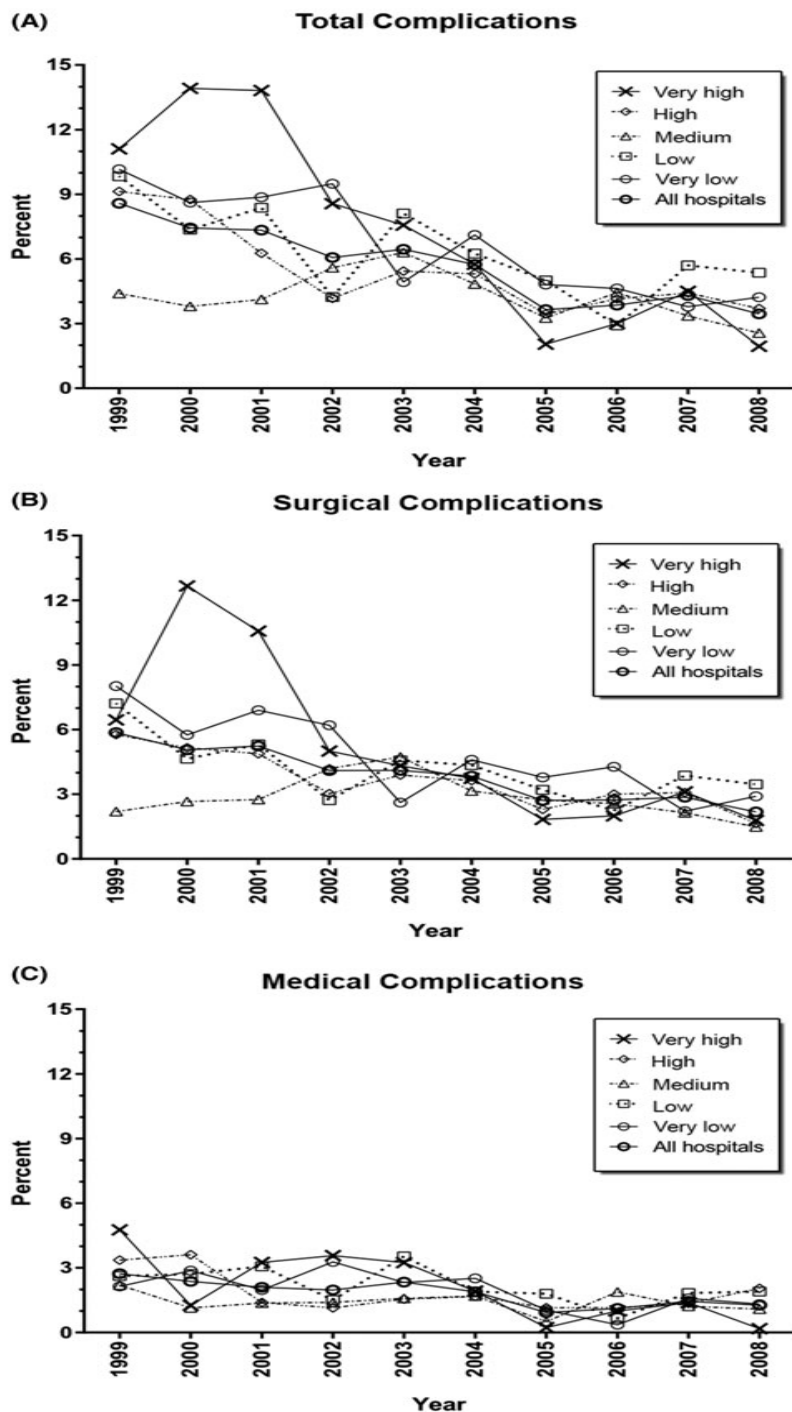
Objective: To examine trends in the frequency and quality of surgery for primary hyperparathyroidism (PHPT) in California during the period of 1999 to 2008.

Background: The quality of surgery for PHPT can be measured by the complication rate and the success rate of surgery. A fraction of patients with failed initial surgery undergo reoperation.

Methods: Data on patients undergoing parathyroidectomy (PTx) were obtained from the California Office of Statewide Health Planning and Development. Renal transplant recipients and dialysis patients were excluded. Hospitals were categorized by case volume: Very low: 1 to 4 operations annually; Low: 5 to 9; Medium, 10 to 19; High: 20 to 49; Very high: 50 or more. Complication rates and the percentage of cases requiring reoperation were analyzed.

Results: A total of 17,082 cases were studied. Annual case volume grew from 990 to 2746 (177% increase) over the study period, corresponding to a 147% increase in the per capita PTx rate. The proportion of cases performed by very high-volume hospitals increased from 6.4% to 20.5% ($P < 0.001$). The overall complication rate declined from 8.7% to 3.8% ($P < 0.001$). Complication rates were inversely related to hospital volume (very high volume, 3.9% vs very low volume, 5.2%, $P < 0.05$). Reoperation was performed in 363 patients (2.1%). The reoperation rate increased from 0.91% to 2.73% during the study period ($P < 0.01$). The reoperation rate was inversely and nonlinearly related to hospital volume, as described by the equation $\% \text{ reoperation} = 100/(\text{total hospital case volume})$.

Conclusions: Surgery for PHPT has grown safer and more common over time. High-volume centers have lower rates of complication and reoperation.





**Take
home message*

**“Those who
cannot remember
the past
are condemned
to repeat
it.”**

George Santayana

Paratiroid Cerrahisi Tarihi

- Paratiroid kapsülü rüptüre edilmemeli
- İlk operasyon en yüksek tedavi şansı sağlar
- Normal bez asla rezeke edilmemelidir
- Paratiroid tümörleri EKTOPİK yerleşimli olabileceği unutulmamalı